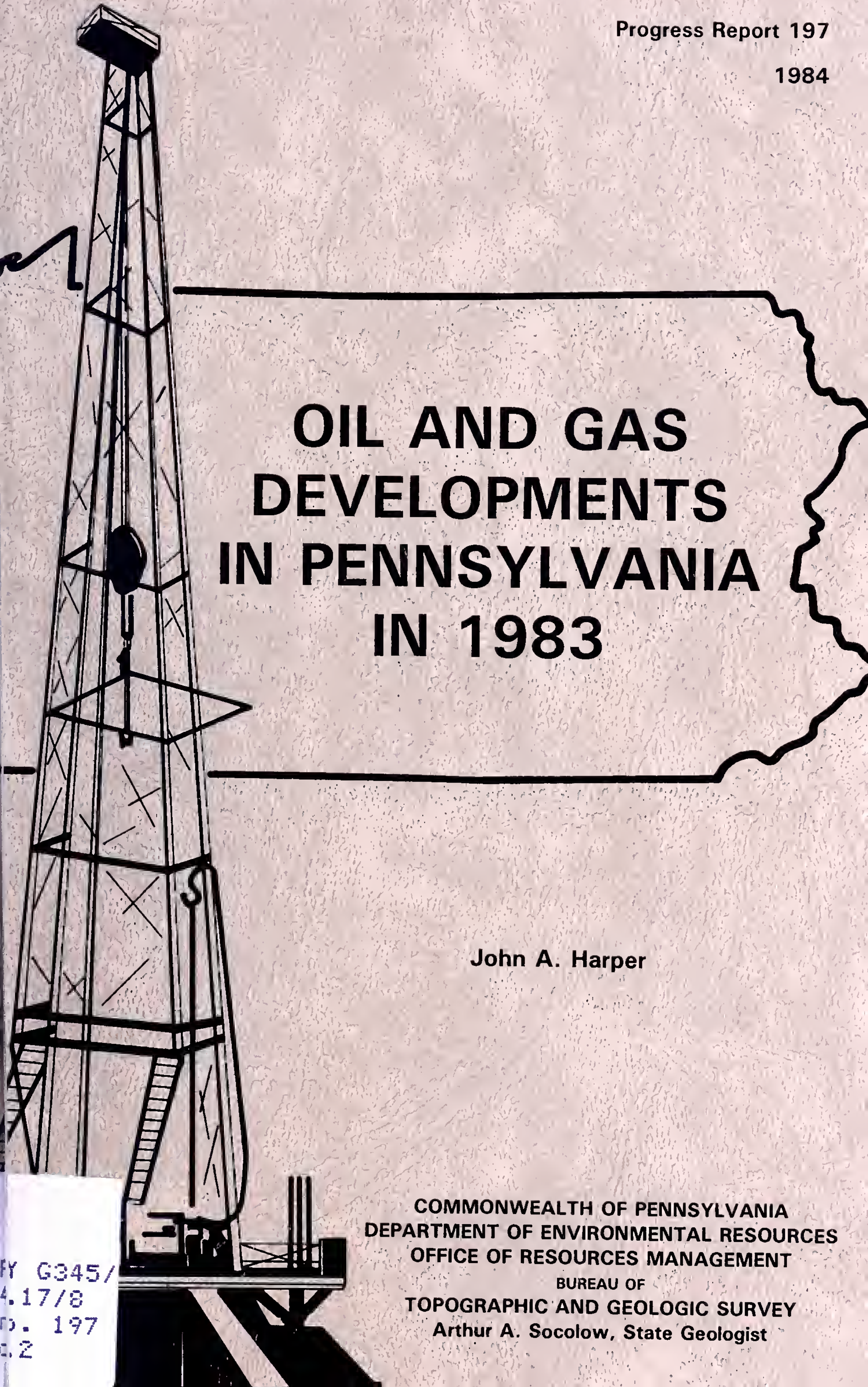
Progress Report 197

1984



OIL AND GAS DEVELOPMENTS IN PENNSYLVANIA IN 1983

John A. Harper

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
OFFICE OF RESOURCES MANAGEMENT
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
Arthur A. Socolow, State Geologist

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by **John A. Harper**
Pennsylvania Geological Survey

PENNSYLVANIA GEOLOGICAL SURVEY

FOURTH SERIES

HARRISBURG

1984

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PY G345/4.17/8 no. 197 c.2
Harper, John A.
Oil and gas developments i
Pennsylvania in 1983

ISBN: 0-8182-0056-1

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OIL AND GAS DEVELOPMENTS IN PENNSYLVANIA IN 1983

by

John A. Harper

ABSTRACT

Pennsylvania's oil production totaled 4,490,672 barrels in 1983, a 5 percent increase over 1982 production. Oil reserves increased 43 percent from 49,764,000 barrels in 1982 to 71,010,000 barrels in 1983. Leading counties for production of oil were Warren, Venango, and McKean. In 1983 secondary recovery of oil in the Bradford field accounted for only 19 percent of the state total. New secondary recovery projects were begun in Venango and Elk Counties, and old projects, both waterflood and microemulsion-polymer varieties, continued in Elk, Forest, McKean, Venango, and Warren Counties. Both of the state's microemulsion-polymer projects are located in the Bradford field, McKean County.

Gas production decreased 2 percent from 121,111 million cubic feet in 1982 to 118,372 million cubic feet in 1983. Gas reserves decreased 7 percent from 1,997,029 million cubic feet in 1982 to 1,854,477 million cubic feet in 1983. Stored recoverable gas also decreased 8 percent, to 581,193 million cubic feet.

The price for all crude oil and oil products declined in 1983 nationwide. The price of Penn Grade Crude oil was $30.00 per barrel on January 1, but dropped to $28.00 per barrel on February 16. New gas prices were subject to Natural Gas Policy Act price ceilings. The wellhead price of 1,000 cubic feet of natural gas ranged from a low of $0.45 under old contracts to $5.68 for ''tight'' gas (NGPA Section 107, High-Cost Gas). The average price for gas was about $3.00.

The total number of wells reported drilled in 1983 was 2,540, a 40 percent decrease from 1982. Total footage drilled was 5,391,845 feet, a 43 percent decrease. The total number of oil wells reported drilled was 1,436, a decrease of 34 percent over the 1982 figure of 2,175. The most active counties for oil well drilling were Venango, Warren, Forest, and McKean, accounting for 96 percent of all oil wells drilled in the state. A total of 930 gas wells was reported in 1983 for a 46 percent decrease from 1982. The most active counties for gas well drilling were Erie, Indiana, Jefferson, Warren, and Crawford, accounting for 93 percent of all gas wells drilled in the state. There were 33 combination oil and gas

wells reported in 1983, an increase of 38 percent over 1982. Fifteen of these wells were drilled in Warren County.

Exploratory drilling in 1982 decreased by 57 percent, from 214 wells reported in 1982 to 122 wells reported in 1983. Development drilling decreased 39 percent in 1983, to 2,340 wells. The success rate for exploratory drilling was 88 percent; it was 98 percent for development drilling.

Seismic exploration declined by 31 percent, from 34 crew-months in 1982 to 23.6 crew-months in 1983. Seismic crews operated in 28 counties in Pennsylvania during the year, at a total expenditure of $5,900,000.

Present activity within the Oil and Gas Geology Division of the Bureau of Topographic and Geologic Survey includes a combined revision of the oil and gas well-record files and the oil and gas base-map series, and the conclusion of a two-year study of the oil and gas potential of southwestern Pennsylvania. The map and file revision project will result in the files and maps being revised to the state's permit numbering system, and the base maps being revised to 7½-minute scale from the present 15-minute scale. The southwestern Pennsylvania project includes detailed stratigraphic, structural, and petrographic studies of the oil and gas fields and reservoirs in the area. The purpose of the study is to encourage new drilling and production in southwestern Pennsylvania.

INTRODUCTION

This report is based for the most part on drillers' well records and location plats filed with the Bureau of Oil and Gas Management, Pennsylvania Department of Environmental Resources. The statistics of oil and gas drilling are compiled only from the records received during the calendar year. This includes records of wells drilled prior to, but reported in, 1983; it does not include 1983 wells for which records were submitted to the Commonwealth after December 31, 1983. Crude-oil production and reserve figures are published courtesy of the Penn Grade Crude Association of Bradford, Pennsylvania. Ms. Mary Ann Gross, Equitable Gas Company, supplied data on natural gas production and reserves.

ACKNOWLEDGEMENTS

Grateful acknowledgement is extended to the following industry and government organizations without whose help this report would have been impossible: American Gas Association; American Petroleum Institute; Ap-

palachian Oil Scouts Association; Bureau of Oil and Gas Management, Pennsylvania Department of Environmental Resources; Bureau of Statistics, Pennsylvania Department of Commerce; Division of Minerals, Bureau of Forestry, Pennsylvania Department of Environmental Resources; Penn Grade Crude Association; and U.S. Department of Energy.

Special thanks go to all of the operators, companies, and personnel of Pennsylvania's oil and gas industry who released natural gas production statistics and mechanical logs, and who provided data on producing formations, intervals, drilling costs, and oil and gas prices.

The following staff members of the Oil and Gas Geology Division, Bureau of Topographic and Geologic Survey, are acknowledged: Cheryl L. Cozart and Christopher D. Laughrey, who assisted in the compilation of this report; and Lajos J. Balogh, who drafted the figures.

PRODUCTION AND RESERVES

CRUDE OIL PRODUCTION

Pennsylvania's crude oil industry produced 4,490,672 barrels (bbl) of Penn Grade crude oil in 1983, reflecting an increase of 5 percent over the 1982 production total of 4,282,354 bbl. Most of this production was from Upper Devonian and Lower Silurian reservoirs, but there was some subsidiary production from Pennsylvanian and Mississippian reservoirs. Lower Silurian Medina Group sandstones in Erie and Crawford Counties produced 88,718 bbl of crude oil, an increase of 24 percent over the previous year. See Figure 1 for a summary of these statistics.

Figure 1. Crude oil production in Pennsylvania, 1983.

Penn Grade oil	1983	1982	% Change	Cumulative to 12/31/83
			(1,000 barrels)	
Shallow oil[1]	4,402	4,211	+ 5	1,312,022
Deep oil[2]	89	71	+ 25	[3]1,175
TOTAL OIL	4,491	4,282	+ 5	1,313,197

[1] Shallow oil: from Late Devonian or younger rocks, generally less than 2,000 feet deep.

[2] Deep oil: from Lower Silurian Medina Group.

[3] Includes production of oil previously classified as "Corning Grade."

Figure 2 illustrates the amount of oil produced and the total number of producing oil wells in Pennsylvania in 1983, by county. Production statistics for oil in Pennsylvania's counties are based on commerce figures, the amount that is shipped or sold, rather than on the actual amount produced from each well. The leading counties for oil production during the year were Warren, Venango, and McKean, in that order, continuing a trend that has been established for a number of years. These three counties were responsible for 73 percent of the total oil produced in Pennsylvania.

Figure 2. Oil wells and crude oil produced in Pennsylvania in 1982 and 1983, by counties.[1]

County	Crude oil production (barrels) 1983	1982	Number of producing oil wells 12/31/83	12/31/82
Allegheny	72,568	65,606	383	347
Armstrong	11,034	10,293	107	96
Beaver	31,278	6,335	93	77
Butler	67,227	56,701	1,222	1,113
Clarion	19,411	24,540	217	190
Clearfield	375	418	4	4
Crawford	83,904	51,931	126	116
Elk	428,138	385,858	171	170
Erie	4,814	3,430	80	64
Fayette	514	680	2	2
Forest	199,842	165,409	1,018	983
Greene	24,974	23,575	258	244
Indiana	3,240	2,850	117	80
Jefferson	3,489	4,791	21	14
Lawrence	80	0	2	2
McKean	827,935	920,548	6,709	9,791
Mercer	9,145	7,733	88	74
Potter	19,749	16,792	98	86
Venango	832,408	821,954	4,291	4,412
Warren	1,207,129	1,050,325	5,089	4,966
Washington	94,392	94,055	604	585
Westmoreland	8,873	4,111	39	22
TOTAL	3,950,519	3,717,935	20,739	23,438

[1] Compiled by the Pennsylvania Department of Commerce, Bureau of Statistics.

DEVELOPED CRUDE OIL RESERVES

Developed crude oil reserves in Pennsylvania at the end of 1983 totaled 71,010,000 bbl, an increase of 43 percent over the previous year's total of

49,946,000 bbl. McKean, Venango, and Warren Counties once again were ranked as the top three counties for oil reserves in the Commonwealth. New reserves were added everywhere but in southwestern Pennsylvania, an area that includes all counties south of Venango. McKean and Potter Counties had the largest reserve increases because of new drilling in old waterflooded areas. Although not large, the Erie and Crawford County reserve increases are the result of increased exploratory and development drilling in the Lower Silurian Medina Group, which has considerably expanded the known reservoirs in those counties over the last 4 years. Figure 3 shows crude oil reserve statistics by shallow and deep reservoirs.

Figure 3. Crude oil reserves in Pennsylvania, 1983.

Reserves	1983	1982	% Change
	(1,000 barrels)		
Shallow oil[1]	70,234	49,399	+ 42
Deep oil[2]	776	365	+113
Total oil	71,010	49,764	+ 43

[1] Shallow oil: from Late Devonian or younger rocks, generally less than 2,000 feet deep.

[2] Deep oil: from Lower Silurian Medina Group.

SECONDARY AND TERTIARY CRUDE OIL RECOVERY PROJECTS

A total of 78 service wells, including waterflood wells, gas-injection wells, tertiary recovery project wells, disposal wells, stratigraphic core test wells, and gas-storage observation wells, was reported in 1983. Elk County had 40 service wells, and Forest and Venango Counties had 18 and 11 service wells, respectively. Other service wells were reported in Crawford, McKean, and Westmoreland Counties. The Crawford County service well was a disposal well in the Lower Devonian Helderberg Group, and the well in Westmoreland County was drilled for storage observation in the Oakford storage pool, Oakford field. These 78 service wells represent a 57 percent decrease in oil-related services over 1982.

In a historical sense, the Bradford field in McKean County is the first field in which large-scale waterflooding technology was attempted. Flooding began in the field, probably by accident, sometime in the late 1800's, and intentional flooding began soon after. It was not until the early 1900's, however, that noticeable production enhancement became apparent. Since that time, most of the Bradford field has been under waterflood. Figure 4 shows the changes in oil production in Pennsylvania since Drake's well was drilled in 1859, and the changes in oil production in the Bradford field. It should be noted that in 1983 the Bradford field produced approximately 19 percent of the total state production.

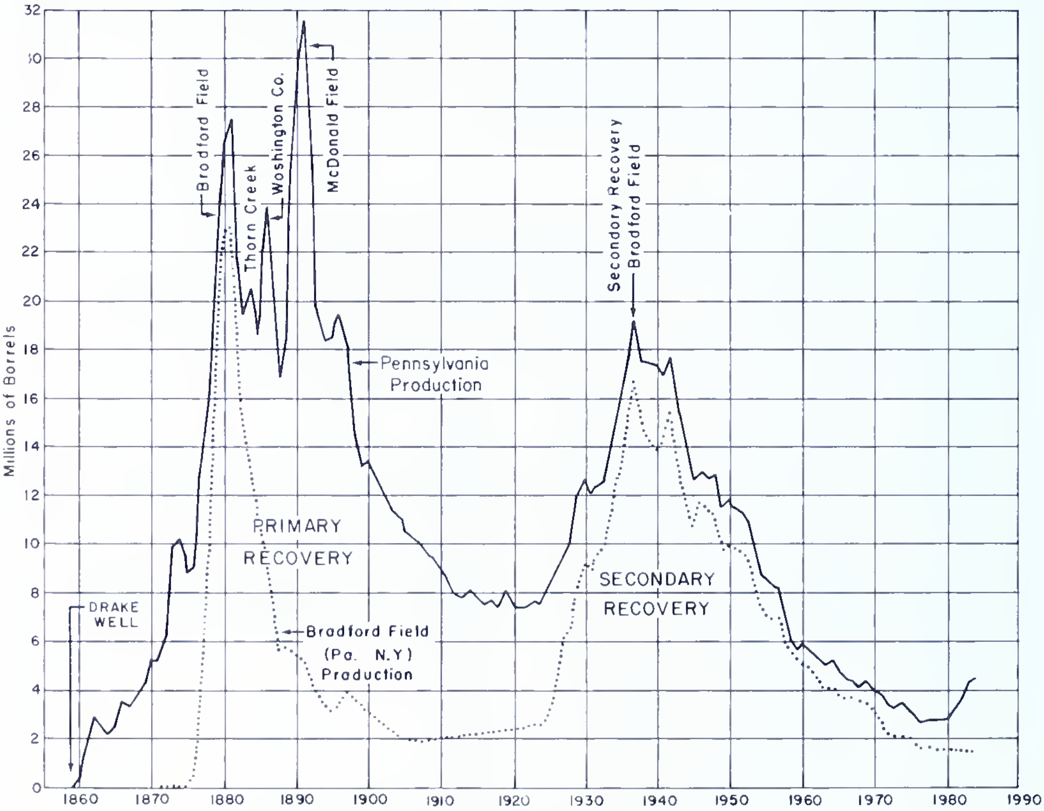

Figure 4. Annual production of crude oil in Pennsylvania, 1859-1983.

There were nine new secondary recovery projects reported in 1983, and several other new projects were reported to be under consideration. New projects were reported in the Kane field (Elk County), and in several fields in Venango County. The Elk County projects involve the Bradford Group sands. In addition, Pennzoil Company expanded its Highland Warrant project in the Kane sand (Bradford Group) of Elk County by an additional 255 acres. The new injection wells were expected to be put into operation in early 1984.

Pennzoil Company operates two tertiary recovery projects, both of the microemulsion-polymer type, in the Bradford Third sand of the Bradford field. Special Project 7 is being scheduled for selective abandonment in 1984, and Special Project 8 was in the polymer-solution injection stage at the end of 1983. This latter project, with 126 producing wells and 59 injection wells, encompasses 220 acres of previously waterflooded Bradford Third sand.

NATURAL GAS PRODUCTION

Pennsylvania's natural gas production decreased in 1983 by 2 percent, down to 118,372 million cubic feet (Mmcf) from the 1982 total of 121,111 Mmcf. The number of producing gas wells increased 4 percent to an estimated 24,000. Figure 5 shows 1983 gas production statistics for Pennsylvania. Included is a general breakdown of gas production by shallow and deep reservoirs.

Figure 5. Natural gas production in Pennsylvania, 1983.

	1983	1982	% Change	Cumulative to 12/31/83
	(millions of cubic feet)			
Shallow gas[1]	90,449	95,332	- 5	--
Deep gas[2]	27,923	25,779	+ 8	--
TOTAL GAS	118,372	121,111	- 2	9,759,305

[1] Shallow gas: from Late Devonian or younger rocks, generally less than 4,000 feet deep.

[2] Deep gas: from Middle Devonian or older rocks, generally more than 4,000 feet deep.

NATURAL GAS RESERVES

Proven recoverable reserves of natural gas in Pennsylvania decreased 7 percent to 1,854,477 Mmcf in 1983. Stored recoverable gas decreased 8 percent as well, to 581,193 Mmcf. Figure 6 shows natural gas reserve figures for Pennsylvania in 1983, and Figure 7 graphically illustrates the differences among production, consumption, and reserves of natural gas for the last 37 years.

Figure 6. Natural gas reserves in Pennsylvania, 1983.

	1983	1982	% Change
	(millions of cubic feet)		
Total gas	1,854,477	1,997,029	- 7
Stored recoverable gas	581,193	631,483	- 8

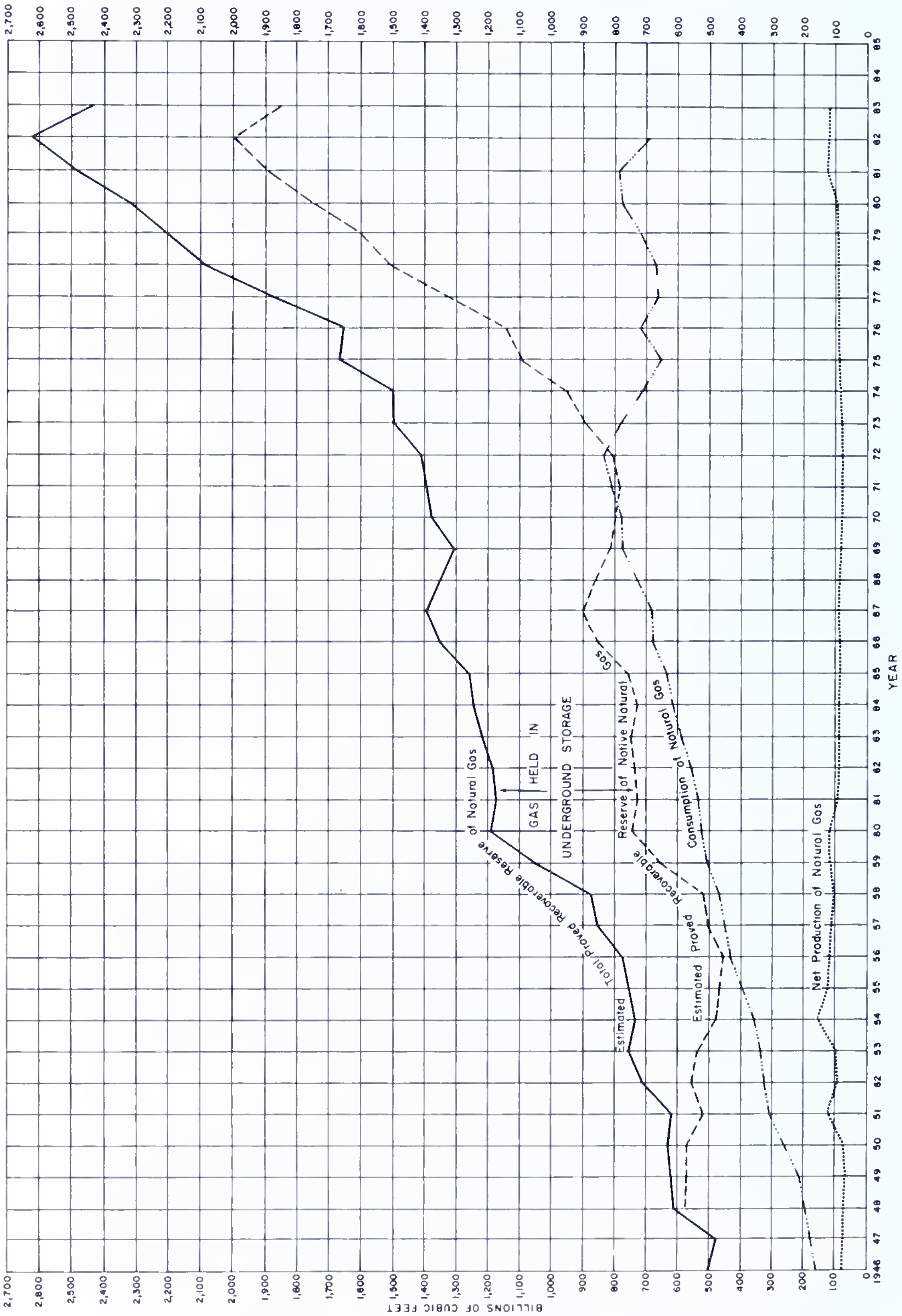

Figure 7. Production, consumption, and reserves of natural gas in Pennsylvania.

NATURAL GAS STORAGE AREAS

Since the early 1920's, Pennsylvania has consumed more natural gas than it has been able to produce. This has led to the necessity of storing natural gas in large quantities in the summer months to at least partially ensure an adequate supply during the winter. Storage reservoirs are typically old depleted gas-producing reservoirs, or bodies of rock whose geological and engineering characteristics would have made them ideal reservoirs had natural gas been emplaced in them. In Pennsylvania all of the major gas-producing horizons have been used at one time or another as storage reservoirs, but the most common reservoirs are Upper Devonian Bradford and Venango Group sandstones and fractured reservoirs in the Oriskany Sandstone. Figure 8 shows the locations and names of all active gas storage areas in Pennsylvania in 1983. No changes in storage-area status were reported during the year. Recoverable gas in storage totaled 581,193 Mmcf in 1983 as compared with 631,482 Mmcf in 1982.

OIL AND GAS PRICES

The price for crude oil continued to decline early in 1983 following the trend set in mid-1981 after decontrol of oil allowed the market to reach its own level. Penn Grade crude oil sold for $30.00 per barrel on January 1, 1983 and dropped to $29.00 on January 19. On February 16, the price fell to a low of $28.00 per bbl and stayed there the remainder of the year. Changes in crude-oil pricing in 1983 are shown in Figure 9.

Natural gas prices are subject to controls under the Natural Gas Policy Act (NGPA) of 1978. The object of NGPA was to allow natural gas prices to rise over a period of 5 or 6 years in order to provide operators with an incentive to increase exploration and drilling, while, at the same time, cushion the consumer against the shock of inevitable utility price hikes. The lowest prices paid by utilities in Pennsylvania were for old gas, subject to old contracts, produced from pre-NGPA wells. Prices as low as $0.45 per thousand cubic feet (Mcf) are common in some of the older producing areas of the Commonwealth such as Allegheny, Washington, and Greene Counties. The highest price allowed by NGPA was $5.68 per Mcf for Section 107 (High-Cost Gas, in this case the price paid for gas from the tight Medina Group), and this was also the highest price paid. Figure 10 shows NGPA price ceilings for natural gas during 1983.

DRILLING AND COMPLETION COSTS

The costs of drilling and completing a well, given below in dollars per foot, vary with the company, drilling depth, method of completion, and geographic

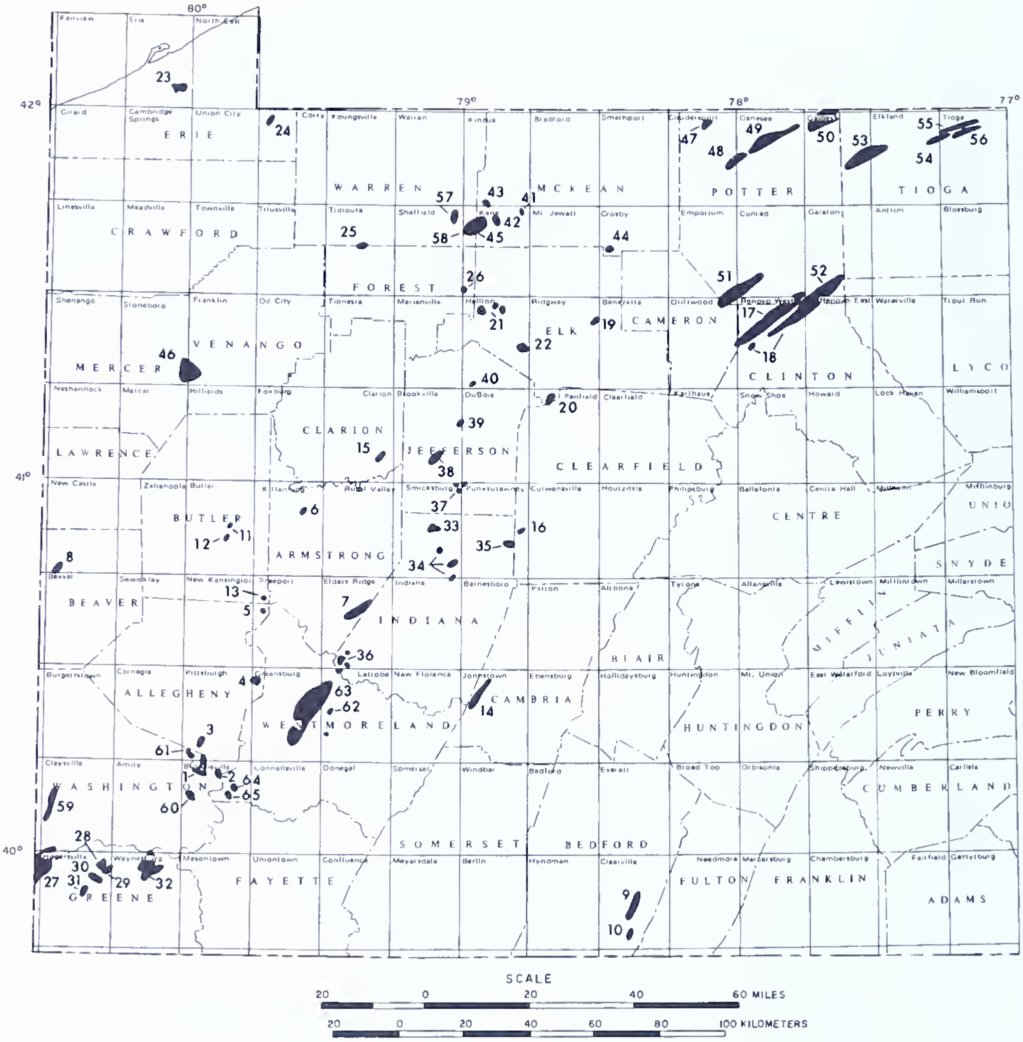

Figure 8. Active gas storage areas of Pennsylvania.

NAMES OF ACTIVE GAS STORAGE AREAS IN PENNSYLVANIA

ALLEGHENY COUNTY

1. Bunola
2. Gamble Hayden
3. Tepe
4. Murrysville (Dice)
5. Smith Parke

ARMSTRONG COUNTY

6. Fair and Helm
7. South Bend

BEAVER COUNTY

8. Black Hawk

BEDFORD COUNTY

9. Artemas A
10. Artemas B

BUTLER COUNTY

11. Vardy
12. Portman
13. Hughes

CAMBRIA COUNTY

14. Rager Mountain

CLARION COUNTY

15. Truittsburg

CLEARFIELD COUNTY

16. Gourley-Miller

CLINTON COUNTY

17. Leidy
18. Tamarack

ELK COUNTY

19. St. Marys
20. Boone Mountain
21. Owls Nest
22. Belmouth

ERIE COUNTY

23. Summit
24. Corry

FOREST COUNTY

25. Queen
26. Duhring

GREENE COUNTY

27. Majorsville-Heard
28. Swarts West

NAMES OF ACTIVE GAS STORAGE AREAS IN PENNSYLVANIA *(Continued)*

GREENE COUNTY (Cont.)

29. Swarts
30. Hunters Cave
31. Holbrook
32. Pratt

INDIANA COUNTY

33. Alabran
34. Kinter
35. Clark
36. Schmidt

JEFFERSON COUNTY

37. Sprankle
38. Galbraith
39. Markle
40. Munderf

McKEAN COUNTY

41. Meade Run
42. Keelor
43. Swede Hill
44. Wellendorf
45. East Branch "B"

MERCER COUNTY

46. Henderson

POTTER COUNTY

47. Sharon
48. Hebron
49. Ellisburg
50. Harrison
51. Wharton
52. Greenlick

TIOGA COUNTY

53. Sabinsville
54. Palmer
55. Tioga
56. Meeker

WARREN COUNTY

57. Deerlick
58. East Branch "A"

WASHINGTON COUNTY

59. Donegal
60. Colvin
61. Finleyville

WESTMORELAND COUNTY

62. Seanor
63. Oakford
64. Webster
65. Patton

Figure 9. Crude oil prices in Pennsylvania, 1983.

Month	Price per barrel
January 1, 1983	$30.00
January 19, 1983	$29.00
February 16, 1983	$28.00

area. Costs generally increase yearly due to inflation (some costs actually decreased in 1983 because of the general slowdown in the industry), but they may also increase as total depth increases, especially for wells that penetrate deeper, untested or undrilled formations. Dry holes are generally less expensive than producing wells because not as much is done to the hole outside of drilling and, perhaps, logging. Extremely deep wells may be extraordinarily expensive, not just because of increased rig time and increased casing, cementing, and other needs, but because provisions must be made for potential, unforeseen problems. Wells drilled in untested formations and/or unexplored areas may require special testing and completion techniques as well. In Pennsylvania an average well would be drilled about 2,123 feet deep (the average total depth for all wells reported in 1983), probably to the Upper Devonian Venango or Bradford Group. As such, a deep well (Lower Devonian Ridgeley

Figure 10. Natural gas price ceilings under federal Natural Gas Policy Act in 1983.

NGPA Section	Category of gas	Maximum lawful price for deliveries made in: Jan. 1983	Feb. 1983	Mar. 1983	Apr. 1983	May 1983	June 1983	July 1983	Aug. 1983	Sept. 1983	Oct. 1983	Nov. 1983	Oec. 1983
		cost per million British Thermal Units (in dollars)											
102	New, Natural Gas	3.299	3.321	3.344	3.367	3.394	3.421	3.448	3.472	3.496	3.520	3.542	3.564
103	New, Onshore Production wells	2.722	2.732	2.742	2.752	2.765	2.778	2.792	2.803	2.814	2.825	2.833	2.841
107 (c) (5)	Gas Produced from Tight Formations	5.444	5.464	5.484	5.504	5.530	5.556	5.584	5.606	5.628	5.650	5.666	5.682
108	Stripper Gas	3.535	3.559	3.583	3.607	3.636	3.665	3.694	3.720	3.746	3.772	3.795	3.818

Formation or Lower Silurian Medina Group) is generally greater than 5,000 feet deep, and anything deeper than 10,000 feet is considered ultra deep.

Because drilling conditions and company policies vary widely, even within a small geographic area, the drilling costs listed below are only estimates and should not be used as anything more than "ballpark" figures for the industry in 1983.

1. Venango County, shallow oil well in the Venango Group sands, about 800 feet deep. Dry hole,* about $8 per foot. Completion, about $35 per foot.
2. McKean County, shallow oil well in the Bradford Group sands, about 2,500 feet deep. Dry hole,* about $14 per foot. Completion, about $24 per foot.
3. Indiana County, shallow gas well in the Bradford Group sands, about 3,600 feet deep. Dry hole,* about $33 per foot. Completion, about $45 per foot.
4. Clearfield County, shallow Devonian gas, about 3,600 feet deep. Dry hole,* about $33 per foot. Completion, about $40 per foot.
5. Fayette County, shallow Devonian gas, about 3,900 feet deep. Dry hole,* about $27 per foot. Completion, about $38 per foot.
6. Erie County, shallow gas well in the Ohio Shale, about 900 feet deep. Completion, about $15 per foot.
7. Erie-Crawford County, deep gas well in the Medina Group, about 3,500 feet deep. Dry hole,* about $20 per foot. Completion, about $33 per foot.
8. Venango County, deep Medina gas, about 5,500 feet deep. Dry hole,* about $16 per foot. Completion, about $30 per foot.
9. Somerset County, deep gas well in the Ridgeley Sandstone, about 9,000 feet deep. Dry hole,* about $49 per foot. Completion, about $64 per foot.

*No completion attempted.

1983 DRILLING AND COMPLETIONS

TOTAL COMPLETIONS

A total of 2,540 wells was reported drilled in Pennsylvania during 1983, reflecting a 40 percent decrease in activity from the 1982 figure of 4,224 wells. This total includes 2,534 new wells and 6 old wells drilled deeper.

The total footage drilled in all reported wells decreased 43 percent, to 5,391,845 feet. The average total depth in all wells drilled was 2,123 feet; this decrease from last year's average of 2,250 is the result of the continued relative increase in the number of shallow oil wells, particularly in Venango and Forest Counties, where an average well is about 800 feet deep. The 10 most active counties for drilling in 1983 were Venango, Warren, Erie, Forest,

Figure 11. New well completions and old wells drilled deeper in Pennsylvania, 1983.

NEW WELL COMPLETIONS

County	No. of wells	Average total depth (feet)
Allegheny	1	2,099
Armstrong	18	3,518
Beaver	6	1,461
Bedford	1	6,495
Butler	14	1,379
Cambria	18	3,747
Centre	4	7,967
Clarion	41	1,915
Clearfield	43	3,673
Clinton	7	5,170
Crawford	63	4,393
Elk	74	2,516
Erie	280	3,113
Fayette	10	4,432
Forest	265	1,016
Greene	42	5,054
Indiana	191	3,720
Jefferson	85	3,407
McKean	116	1,798
Mercer	40	4,451
Mifflin	1	476
Potter	3	1,375
Somerset	1	79
Venango	694	937
Warren	481	1,831
Washington	5	4,589
Westmoreland	30	3,607
TOTAL	2,534	2,125

OLD WELLS DRILLED DEEPER

County	No. of wells	Average total depth (feet)
Armstrong	1	1,792
Beaver	1	370
Clarion	3	1,359
Forest	1	1,281
TOTAL	6	1,253

Indiana, McKean, Jefferson, Elk, Crawford, and Clarion, in that order. Wells in these 10 counties represented 90 percent of all wells reported in the Commonwealth during the year (see Figure 11).

OIL COMPLETIONS

Pennsylvania's oil industry reported 1,436 oil well completions during 1983, including 1 old well drilled deeper. This represents a 34 percent decrease over 1982. Total footage drilled in all oil wells was 1,563,369 feet, a 30 percent decrease over a year ago. The average total depth for all oil wells was 1,089 feet. The most active counties for oil well drilling were Venango, Warren, Forest, and McKean, in order of importance. Drilling in these four counties accounted for 96 percent of all oil wells reported in the Commonwealth in 1983 (Figure 12).

Figure 12. New oil well completions and old wells drilled deeper in Pennsylvania, 1983.

NEW OIL WELL COMPLETIONS

County	No. of wells	Average initial production (bopd)[1]	Average total depth (feet)
Armstrong........................	1	5	900
Butler........................	8	1	1,354
Clarion........................	13	2	1,641
Crawford........................	1	Not given	400
Elk........................	33	Not given	2,483
Forest........................	237	4	992
McKean........................	106	2	1,750
Mercer........................	4	11	706
Venango........................	648	5	844
Warren........................	382	19	1,235
Washington........................	2	9	2,661
TOTAL........................	1,435	19	1,089

OLD OIL WELL DRILLED DEEPER

County	No. of wells	Average initial production (bopd)[1]	Average amount deepened (feet)
Beaver........................	1	1	370

[1] bopd = barrels of oil per day.

GAS COMPLETIONS

Pennsylvania's natural gas industry reported only 930 gas well completions in 1983, including 4 old wells drilled deeper. This figure constitutes a

Figure 13. New gas well completions and old wells drilled deeper in Pennsylvania, 1983.

NEW GAS WELL COMPLETIONS

County	No. of wells	Average initial open flow (Mcfgpd)[1]	Average total depth (feet)
Armstrong	17	904	3,672
Beaver	2	21	1,632
Bedford	1	310	6,495
Butler	2	15	1,894
Cambria	18	746	3,747
Centre	3	177	6,007
Clarion	21	87	2,177
Clearfield	40	1,147	3,661
Clinton	7	554	5,170
Crawford	58	596	4,473
Elk	1	70	5,004
Erie	275	1,312	3,109
Fayette	10	348	4,432
Forest	7	34	2,102
Greene	38	292	1,523
Indiana	190	785	3,721
Jefferson	85	649	3,407
Mercer	29	650	5,601
Potter	2	12	1,558
Venango	18	632	4,378
Warren	73	1,170	4,819
Washington	3	140	5,874
Westmoreland	26	860	3,722
TOTAL	926	901	3,760

OLD GAS WELLS DRILLED DEEPER

County	No. of wells	Average initial open flow (Mcfgpd)[1]	Average amount deepened (feet)
Armstrong	1	60	1,792
Clarion	3	39	1,359
TOTAL	4	45	1,467

[1] Mcfgpd = thousand cubic feet of gas per day.

46 percent decrease over the 1982 figure of 1,734 wells. The total footage drilled in all gas wells was 3,487,851 feet, a 48 percent decrease from the previous year. The average depth for all gas wells was 3,750 feet. The most active counties for gas well drilling were Erie, Indiana, Jefferson, Warren, and Crawford, accounting for 93 percent of all gas wells reported during the year. Figure 13 summarizes these data.

COMBINATION OIL AND GAS WELL COMPLETIONS (Not Reported Separately as Oil or Gas)

The Bureau of Topographic and Geologic Survey classifies any well that is primarily an oil well (i.e., produces any amount of oil) but also produces at least 50 Mcfgpd (thousand cubic feet of gas per day) as a combination oil and gas well. Most oil wells drilled in the Commonwealth produce a little gas, and many produce enough gas to be sold to utilities or pipeline companies. However, if the well produces less than 50 Mcf, regardless of whether or not the gas is sold, it is considered simply as an oil well. Pennsylvania's oil and gas operators reported 32 new combination wells and 1 old well drilled deeper in 1983, a 38 percent increase over the 1982 total of 24. Total footage

Figure 14. New combination oil and gas well completions in Pennsylvania, 1983.

County	No. of wells	Average initial production (bopd)[1]	Average initial open flow (Mcfgpd)[2]	Average total depth (feet)
Clarion.................	4	2	259	2,232
Crawford................	3	Not given	933	4,436
Erie....................	2	Not given	2,100	3,680
Forest..................	3	37	80	1,670
Potter..................	1	10	244	1,011
Venango.................	3	Not given	2,150	1,296
Warren..................	15	3	99	1,703
Westmoreland............	1	10	150	3,340
TOTAL..............	32	6	519	2,137

OLD COMBINATION WELL DRILLED DEEPER

County	No. of wells	Average initial production (bopd)[1]	Average initial open flow (Mcfgpd)[2]	Average total depth (feet)
Forest..................	1	1	542	1,281

[1] bopd = barrels of oil per day.
[2] Mcfgpd = thousand cubic feet of gas per day.

for these 33 wells was 69,664 feet, a 9 percent increase from a year ago. The average depth for the 33 wells was 2,111 feet. Fifteen of these wells, or 45 percent, were drilled in Warren County (Figure 14).

DRY COMPLETIONS

A total of 63 dry holes was reported in Pennsylvania in 1983. These wells represent a 42 percent decrease in the number of dry holes from the 1982 total of 109. However, the success rate for all drilling remained at 97 percent despite this decrease, reflecting the decrease in all drilling during 1983. The total footage for dry holes in 1983 was 128,124 feet, a 51 percent decrease. The average total depth for all dry holes, both new completions and old wells drilled deeper, was 2,034 feet (Figure 15).

Figure 15. New dry hole completions in Pennsylvania, 1983.

NEW DRY HOLE COMPLETIONS

County	No. of dry holes	Average total depth (feet)
Allegheny	1	2,099
Beaver	4	1,375
Butler	4	1,174
Centre	1	13,848
Clarion	3	853
Clearfield	3	3,833
Erie	3	3,089
Greene	4	1,394
Indiana	1	3,653
McKean	3	2,782
Mercer	7	1,828
Mifflin	1	476
Somerset	1	79
Venango	14	860
Warren	11	2,867
Westmoreland	2	2,244
TOTAL	63	2,034

MISCELLANEOUS COMPLETIONS

Miscellaneous completions include all oil- and gas-related wells that cannot specifically be considered oil- and gas-producing wells. These wells comprise several types: stratigraphic core tests, drilled to collect subsurface information such as formation thickness or the effects of well completion on various rock types; water-supply wells for waterflood projects; fluid-injection wells for secondary and tertiary recovery of oil; liquid-waste disposal wells; and gas-storage observation wells. Increases and decreases within this category do not accurately reflect oil and gas drilling trends because, for instance, an oil field operator may drill all of his water-supply wells and fluid-injection wells several years after the oil-producing wells were completed.

During 1983, 78 miscellaneous (service) wells were reported in Pennsylvania. This is a 57 percent decrease (104 wells) from 1982. Most of the service wells reported during the year were injection wells for secondary or tertiary oil recovery projects, but there were also some stratigraphic core tests, a disposal well, and a storage observation well. The total footage drilled in these 78 wells was 142,837 feet, a 33 percent decrease from the footage drilled in 1982. The average total depth for all service wells was 1,831 feet. Drilling in Elk, Forest, and Venango Counties accounted for 89 percent of all service wells reported in 1983 (see Figure 16).

Figure 16. New service well completions in Pennsylvania, 1983.

NEW SERVICE WELL COMPLETIONS

County	No. of wells	Average total depth (feet)
Crawford	1	3,592
Elk	40	2,481
Forest	18	795
McKean	7	1,893
Venango	11	804
Westmoreland	1	3,614
TOTAL	78	1,831

DRILLING AND PRODUCTION ACTIVITY
(Classified as Shallow or Deep)

The Oil and Gas Geology Division of the Bureau of Topographic and Geologic Survey classifies oil and gas wells as shallow or deep, not depending on depth, but on whether or not the Upper-Middle Devonian boundary was penetrated in the well. Wells that penetrate the boundary (normally the top of the Tully Limestone, but may be an equivalent shale) are considered deep. Wells that do not penetrate the boundary are considered shallow, regardless of depth. Because of the wedge-shaped character of the

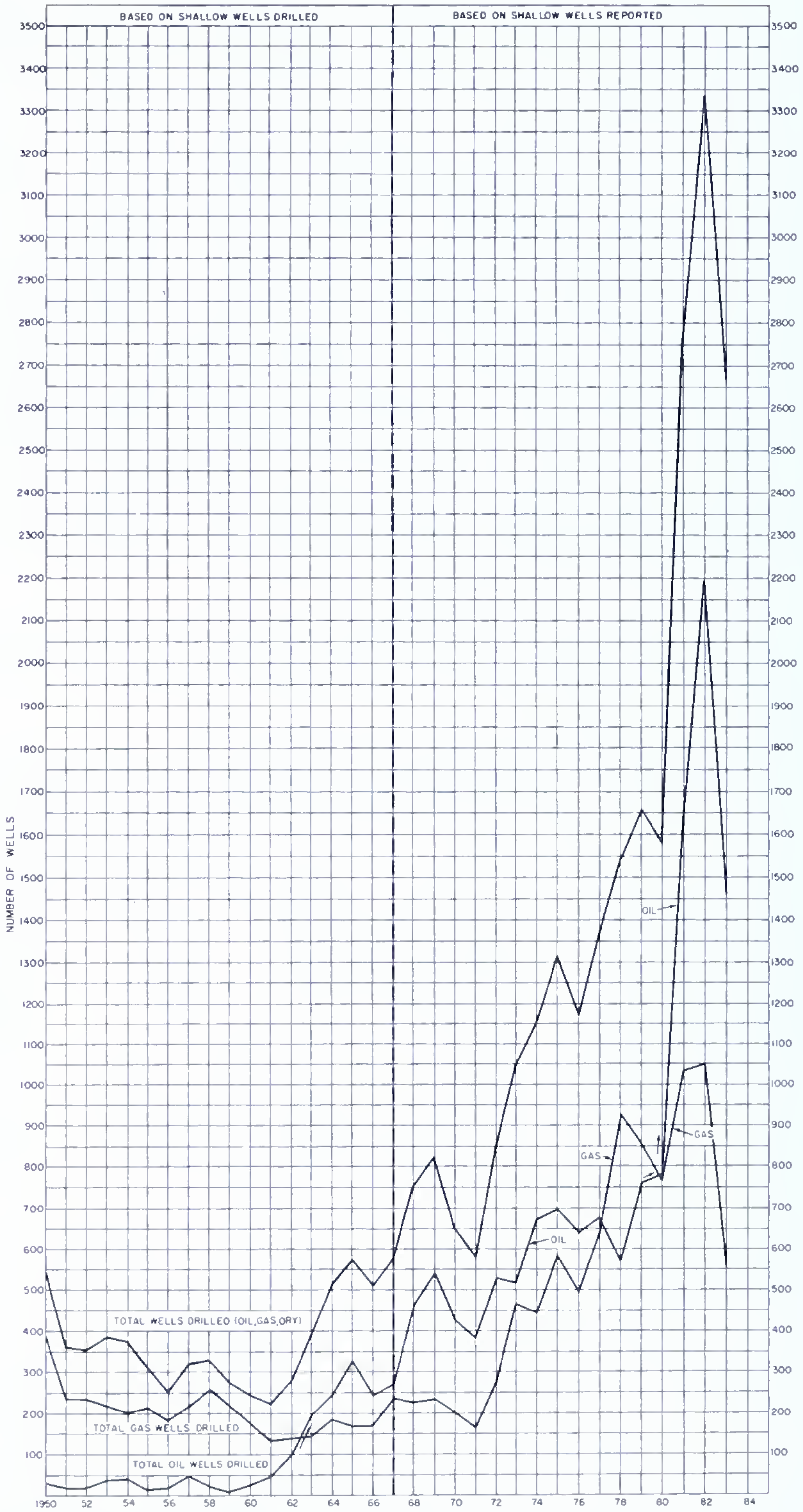

Figure 17. Shallow well activity, 1950–83 (Late Devonian or younger producing horizons; generally less than 4,000 feet).

sedimentary package deposited in the Appalachian basin, absolute drilling depth is not instrumental. A Lower Silurian Medina Group well in Erie County along the lake shore may be only 2,500 feet deep, and an Upper Devonian Bradford Group well in Clearfield County may be as much as 4,000 feet deep. Yet, the Medina well is considered deep and the Bradford well is considered shallow on the basis of geologic age. Shallow wells, which account for the greatest number of wells drilled in Pennsylvania, may produce oil or gas; deep wells most commonly produce gas, but there are some wells in Erie and Crawford Counties that produce small amounts of oil as well. Figure 17 illustrates shallow-well drilling activity in Pennsylvania over the last 33 years, and Figure 18 shows the changes in deep well activity during the period 1930–83.

The number of shallow wells reported in Pennsylvania in 1983 decreased by 39 percent from 3,528 in 1982 to 2,150 in 1983, including 2,067 new wells drilled for oil or gas, 5 old wells deepened for oil or gas, and 78 new service wells. In general, the shallow oil wells were drilled to the Venango Group and the shallow gas wells were drilled to the Bradford Group. Subsidiary drilling in other shallow horizons found production in the Pennsylvanian, Mississippian (typically the Big Injun sand), Upper Devonian Brallier Formation and Lock Haven Formation sands, and Upper and Middle Devonian shales. Shallow oil and/or gas well drilling in Venango, Warren, Forest, Indiana, McKean, Jefferson, and Erie Counties accounted for 85 percent of all shallow drilling reported in 1983.

In contrast to previous years, deep drilling in Pennsylvania decreased in 1983. During the year, 390 deep wells were reported in the Commonwealth, a decrease of 44 percent over the 1982 figure of 696. Drilling to the Lower Silurian Medina Group in Erie, Warren, and Crawford Counties dominated deep drilling, accounting for 85 percent of all deep well activity, and for 89 percent of all Medina drilling activity.

Figure 19 shows the statistical breakdown for both shallow and deep wells reported in Pennsylvania in 1983. Figure 20 illustrates shallow and deep well drilling in terms of the final reported production formations.

Shallow production totaled 90,448,939 Mcf of gas and 4,401,954 bbl (barrels) of oil, whereas deep production accounted for 27,923,061 Mcf of gas and 88,718 bbl of oil. Figure 21 shows deep gas production during the year by field and pool. Figure 22 summarizes the information in Figure 21 by showing amounts of gas produced from the various deep reservoirs, both as an annual total and as cumulative totals. Figure 23 illustrates the amount of production, the yearly average unit price, and the yearly total values for oil and gas produced in Pennsylvania since 1960.

The drilling depth record for Pennsylvania remains at 21,460 feet, set by the Amoco Production Company #1 Svetz well in Somerset County in 1975. This was the deepest well drilled in the Appalachian basin. The deepest pro-

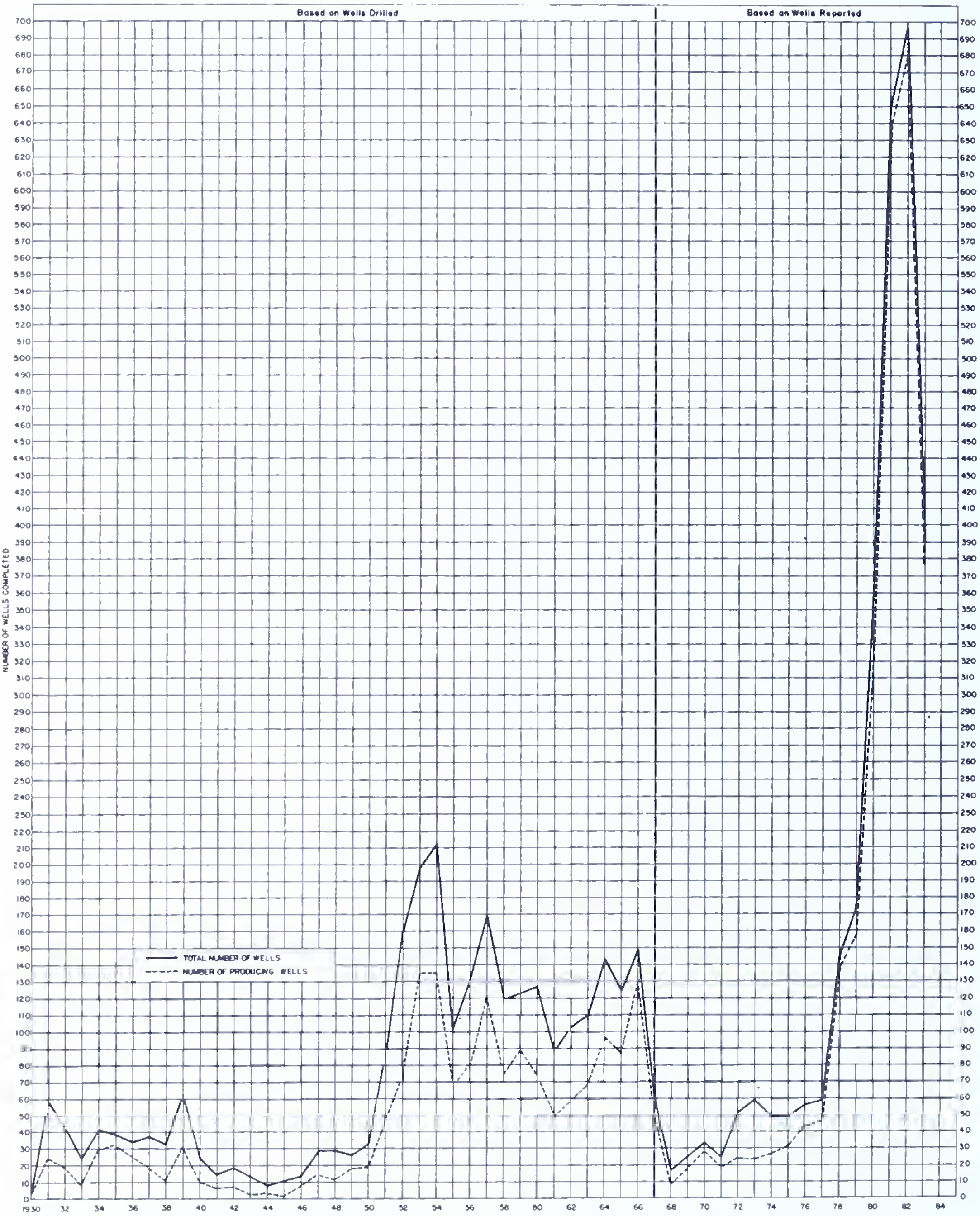

Figure 18. Annual rate of deep sand formation exploration and development, 1930–83 (Middle Devonian or older producing horizons; generally more than 4,000 feet).

ducing depth in Pennsylvania increased to 13,030 feet from the Bald Eagle Formation (Upper Ordovician) in the Grugan field, Clinton County. This record changed in 1983 from a previous record of 11,458 feet in the Heyn pool (Lower Silurian Tuscarora Formation), Summit field, Fayette County. The previous record had stood for almost 20 years.

Figure 19. Drilling and completion of wells reported, 1983 (according to geologic age and depth of producing horizons).

Shallow--Upper Devonian and younger	
NEW WELLS	
Gas	554
Oil	1,435
Oil and gas	27
Dry	51
Total	2,067
DEEPENED WELLS	
Gas	4
Oil	1
Oil and gas	1
Total	6
MISCELLANEOUS WELLS	
Service	77
Total shallow wells	2,150
Deep--Middle Devonian and older	
NEW WELLS	
Gas	372
Oil and gas	5
Dry	12
Total	389
MISCELLANEOUS WELL	
Disposal	1
Total deep wells	390
TOTAL ALL WELLS DRILLED	2,540

OIL AND GAS EXPLORATORY AND DEVELOPMENT ACTIVITIES

The Pennsylvania Geological Survey, Oil and Gas Geology Division, uses a classification scheme for exploratory and development drilling that is modified from the definitions used by the Committee on Statistics of Drilling of the American Petroleum Institute/American Association of Petroleum

Figure 20. Oil and gas well completions in Pennsylvania by shallow and deep producing formations, 1983.

		Producing formation	Oil wells	Gas wells	Combination oil and gas wells
SHALLOW		General Pennsylvanian	0	1	0
		General Mississippian	0	3	0
	Comingled		0	3	0
		Venango Group	860	20	4
	Comingled		3	131	4
		Bradford Group	572	277	20
	Comingled		1	23	0
		Elk Group	0	8	0
		Lock Haven Formation	0	10	0
		General Devonian shales	0	[1]85	0
DEEP		Onondaga Group[2]	0	1	0
		Oriskany Sandstone	0	6	0
		Salina Group	0	1	0
		Medina Group	0	360	5
		Bald Eagle Formation	0	1	0
		Total	1,436	930	33

[1] Includes wells drilled to deep formations, but completed as shallow producers.

[2] Includes Huntersville Chert and Onondaga limestone complex.

Geologists. All wells reported here are the same as those reported under drilling and completions in the previous section of this report.

EXPLORATORY WELLS

An exploratory well is one that is drilled to: (1) find and produce oil or gas in unproven areas; (2) find a new reservoir in an area previously known to have oil and/or gas production in another reservoir; or (3) extend the known limit of a productive oil or gas reservoir. New field wildcats, new pool wildcats, deeper pool tests, shallower pool tests, and outpost/extension tests make up the exploratory categories. If the well is drilled as an exploratory test and is not completed for production, it is classified as a dry exploratory hole.

In accordance with the continued general downturn of the national oil and gas industry in 1983, exploratory drilling in Pennsylvania decreased during

Figure 21. Gas production from rocks of Middle Devonian or older age in Pennsylvania, 1983 (classified as "deep" production).

County	Field	Pool	Discovery date	Cumulative production at end of 1982 (Mcf)^1	Production 1983 (Mcf)^1	Cumulative production at end of 1983 (Mcf)^1	Status of field or pool at end of 1983^2	Reservoir^3
Allegheny	Forward	Monongahela	3/25/79	10,000	8,000	18,000	Prod.	MS
Armstrong	Goheenville	Snyderville	10/23/70	7,009,547	17,983	7,027,530	Prod.	O
	Roaring Run	Roaring Run	12/14/70	7,224,784	80,201	7,304,985	Prod. and aban.	O
		Oriskany						
Bedford	Five Forks	Weimer Run	11/ 1/82	0	0	0	SI	O
Bedford and Blair	Pavia		1/20/61	11,600	0	0	Aban.	O
Cambria	Carrolltown	Burley	1/13/69	347,758	6,308	354,066	Prod. and aban.	O
		Pindleton	6/30/69	5,075,532	128,310	5,203,842	Prod. and SI	O
	Pot Ridge		7/ 1/81	0	0	0	SI	O
Cameron	East Emporium		11/18/71	4,889,988	261,401	5,151,389	Prod.	O
Cameron and Elk	Hicks Run		6/ 7/56	4,353,149	8,784	4,361,933	Prod. and aban.	O
	Whippoorwill		7/10/61	16,066,788	69,378	16,136,166	Prod., SI, and aban.	O
Cameron, Clearfield,	Punxsutawney-							
Elk, Indiana, and	Driftwood	TOTAL	9/15/51	382,245,483	610,535	382,856,018	Prod., SI, and aban.	O
Jefferson		Benezette	1/ 5/53	250,867,721	160,970	251,137,621	Prod., SI, and aban.	O
		Driftwood	9/15/51		108,930			
		Grove Hill	2/18/81	10,106	123	10,229	Prod.	O
		Helvetia	5/11/60	131,367,656	37,770	131,708,168	Prod., SI, and aban.	O
		Rockton	2/25/55		298,481			
	Big Run	Reed-Deemer	12/ 1/53		4,261			
Centre	Black Moshannon		3/31/82	0	0	0	SI	M
	Devils Elbow		12/18/77	1,641,154	492,890	2,134,044	Prod. and SI	T
	Runville		2/28/80	145,491	119,414	264,905	Prod.	T
Clarion	Clarion-Miola	Weaver	2/22/80	0	0	0	SI	O
Clearfield	Boone Mountain	Moshannon	9/15/76	46,795	3,260	50,055	Prod.	O
	Gifford Run		1/13/83	0	0	0	SI	O
	Irish Run	Anderson Creek	9/25/75	67,445	0	0	SI	O
	West Decatur		3/30/73	3,762,900	1,351	3,764,251	Prod. and SI	O
		Eagle Eye	12/ 6/81	0	0	0	SI	O
Clearfield, Elk, and	Penfield	DuBois	1/ 6/60	106,070,061	69,276	106,139,337	Prod. and SI	O
Jefferson		Sabula	8/26/63	1,235,090	63,143	1,298,233	Prod. and SI	O
Clinton	Grugan		8/12/82	0	312,100	312,100	Prod.	BE
Clinton and Potter	Leidy	TOTAL	1/ 8/50	160,382,153	18,391	160,400,544	Prod., gas stor.,	O
		Ole Bull	1/ 9/59	5,582,121	18,391	5,600,512	and SI	
Crawford	Athens	TOTAL	9/20/74	3,290,452	1,613,765	4,904,217	Prod. and SI	M
		Brimstone	1/30/79	1,716,168	680,832	2,397,000	Prod. and SI	M
		Dutch Hill	8/31/80	389,017	312,774	701,791	Prod.	M
		Lincolnville	8/16/80	87,464	77,583	165,047	Prod.	M
		Potash Run	3/18/79	186,514	55,629	242,143	Prod.	M
		Rome	6/ 9/79	125,234	290,618	415,852	Prod.	M
		Steuben	12/22/79	0	0	0	SI	M
	Atlantic	Adamsville	8/ 5/81	0	0	0	SI	M
	Blooming Valley		8/ 5/81	0	53,077	53,077	Prod.	M
	Cambridge Springs		1/31/76	271,432	112,285	383,717	Prod. and SI	M
		Cambridge	4/ 6/76	16,606	10,897	27,503	Prod. and SI	M
	Church Run	Hatchtown	6/27/79	400	117,031	117,431	Prod.	M
		Vrooman	12/ 7/79	76,315	346,511	422,826	Prod.	M
	Conneaut Lake		8/ 9/82	0	0	0	SI	M
	Eaton Corners	Brown Hill	11/15/81	0	125,454	125,454	Prod.	M
	Frenchtown		8/17/80	11,385	8,226	19,611	Prod. and SI	M
		Guy Mills	8/26/80	0	0	0	SI and aban.	M
		Mt. Hope	10/31/80	0	0	0	SI	M

Figure 21. *(Continued)*

County	Field	Pool	Discovery date	Cumulative production at end of 1982 (Mcf)[1]	Production 1983 (Mcf)[1]	Cumulative production at end of 1983 (Mcf)[1]	Status of field or pool at end of 1983[2]	Reservoir[3]
Crawford.....................	Geneva	Greenwood	10/31/73	186,607	26,846	213,453	Prod.	M
		Rock Creek	6/27/77	293,650	171,508	465,158	Prod.	M
	Meadville	Tamarack Lake	12/12/80	0	0	0	SI	M
	Papenfuse		11/16/80	87,228	49,429	136,657	Prod. and SI	M
	Randolph	Delamater	9/11/81	0	19,168	19,168	Prod. and SI	M
	Richmond Township	Woodcock	7/21/81	0	37,030	37,030	Prod.	M
		Zirkle	6/22/81	0	NA	NA	NA	M
	Rockdale		11/30/79	340,840	347,360	688,200	Prod., SI, and aban.	M
	South Shenango		8/ 9/79	0	0	0	SI	M
		Espyville	2/ 8/81	0	0	0	SI	M
	Sparta	Eastman Hill	10/30/75	0	0	0	SI	M
	Vernon	Keborts	8/14/81	0	0	0	SI	M
Crawford and Erie............	Conneaut	TOTAL	2/11/57	46,216,280	3,354,462	49,570,742	Prod. and aban.	M
		Beaver Creek	9/26/81	4,262	0	4,262	SI	M
		Blood	12/17/80	0	0	0	SI	M
		Bushnell-Lexington	12/31/58	18,233,962	580,853	18,814,815	Prod., SI, and aban.	M
		Carlson	2/23/81	0	0	0	SI	M
		Center Bar	11/19/78	4,074	0	4,074	SI	M
		Cranesville	6/17/81	2,630	NA	2,630	Prod.	L
		Forro	1/ 4/58	28,284	0	28,284	SI	M
		Indian Springs	9/11/57	16,560,220	1,105,271	17,665,491	Prod., SI, and aban.	M
		Kastle	7/14/62	1,642,763	504,101	2,146,864	Prod. and SI	M
		Lundys Lane	11/ 9/61	4,758,461	906,935	5,665,396	Prod. and aban.	M
		Marsh Run	5/20/82	858	NA	858	Prod.	H
		Mud Run	11/ 5/81	14,250	11,210	25,460	Prod.	M
		Pageville	10/10/80	136,253	162,007	298,260	Prod. and SI	M
		Pennside	2/ 8/81	7,753	6,025	13,778	Prod. and SI	M
		Pierce	12/31/58	921,551	11,989	933,540	Prod.	M
		Rogers	4/ 8/82	0	0	0	SI	O
		Springboro	11/ 7/79	202,298	491	202,789	Prod. and SI	M
		Stone Run	10/21/79	86,903	63,862	150,765	Prod. and SI	M
		West Mead	7/ 8/74	16,274	1,718	17,992	Prod.	M
	Cussewago		6/17/81	6,012	40,512	46,524	Prod. and SI	M
Crawford and Mercer..........	Kantz Corners		7/26/77	6,022,832	2,072,759	8,095,591	Prod. and SI	M
		Barco	12/13/80	14,381	8,643	23,024	Prod.	M
		East Fairfield	7/31/80	336,922	184,456	521,378	Prod.	M
		Mt. Pleasant Road	8/30/80	55,660	25,653	81,313	Prod.	M
		Round Knob	11/12/80	274,729	197,774	472,503	Prod.	M
		Shaws Corners	7/15/80	657,848	236,582	894,430	Prod.	M
Crawford, Mercer, and Venango....................	Cochranton		11/16/80	1,447,266	769,317	2,216,583	Prod. and SI	M
		Deckard	11/ 4/80	179,955	160,472	340,427	Prod.	M
		McDaniels	3/16/81	383,617	126,616	510,233	Prod. and SI	M
Crawford and Warren..........	County Line		1/31/81	27,764	160,439	188,203	Prod. and SI	M
Elk..........................	Horton	Boot Jack	9/20/73	11,275	0	11,275	SI	H
Erie.........................	Alder Run		8/24/74	0	19,562	19,562	Prod.	M
	Carter Hill		5/14/79	55,521	59,955	115,476	Prod.	M
	Columbus	Hare Creek	6/26/81	4,917	21,292	26,209	Prod.	M
	Concord	Harbor Ridge	10/ 2/79	2,106	2,000	4,106	Prod.	M
		Stewart Road	3/10/80	0	0	0	SI	M

	Corry	TOTAL	4/29/47	1,201,891	53,042	1,254,933	Prod., SI, and aban. gas stor.	M
		Beaver Oam	5/20/53	257,445	5,700	263,145	Prod. and SI	M
		Spencer Creek	6/19/70	5,527	5,183	10,710	Prod. and SI	M
		Tarbell	9/12/80	19,121	8,561	27,682	Prod.	M
	Orumlin	Swails	6/27/80	98,612	906,098	1,004,710	Prod. and SI	M
	Edinboro		7/28/80	287,541	195,964	483,505	Prod.	M
	Edinboro North		1/ 9/80	1,211,147	763,807	1,974,954	Prod. and SI	M
		Conneauttee	10/14/82	0	2,631	2,631	Prod.	S
	Erie	Bartosik	3/ 7/79	63,071	33,253	96,324	Prod.	0
		Brandy Run	5/28/79	118	0	118	SI	M
		Charter Oaks	5/19/77	130,717	31,123	161,840	Prod. and SI	M
		Ounn Valley	1/19/80	14,725	4,198	18,923	Prod.	M
		Fairplain	6/ 5/79	677	0	677	SI	M
		Fairview	3/12/76	4,903	1,411	6,314	Prod. and SI	M
		Glenwood	8/ 9/77	87,885	23,401	111,286	Prod.	M
		Goddard	8/31/78	101,801	10,506	112,307	Prod. and SI	M
		Heidler	5/22/79	0	0	0	SI	M
		Lawrence Park	8/30/77	9,264	5,896	15,160	Prod.	M
		McKean	1/19/73	1,118	0	1,118	SI	0
		Talcott	7/ 8/79	120,975	284,715	405,690	Prod.	M
	Franklin Center		6/16/80	157,699	125,744	283,443	Prod. and SI	M
	LeBoeuf	Waterford	3/21/77	2,135,832	928,907	3,064,739	Prod. and SI	M
	Mill Village		7/27/79	1,313,504	1,694,401	3,007,905	Prod.	M
	New Ireland		5/14/78	529,436	207,695	737,131	Prod.	M
		Pattison	11/ 9/79	107,950	85,583	193,533	Prod. and SI	M
	North East	Bailey Brook	1/11/80	29,774	5,777	35,551	Prod.	M
		Bull Reservoir	9/17/60	367,102	293,388	660,490	Prod. and SI	M
		Burgess	10/17/60	2,378,959	288,808	2,667,767	Prod.	M
		Oelhill Corners	6/23/79	2,983	79	3,062	Prod. and SI	N
		Half Moon	9/ 6/79	0	0	0	SI	M
		Harborcreek	10/20/77	909,366	108,457	1,017,823	Prod.	M
		Hornby	6/10/78	920,768	313,653	1,234,421	Prod.	M
		Kuhl	8/14/78	24,253	8,475	32,728	Prod. and SI	M
		Little Hope	12/ 7/78	19,970	2,189	22,159	Prod. and SI	M
		McGuire	2/ 8/80	0	0	0	SI	0
		Orchard Beach	2/18/74	2,457,926	320,600	2,778,526	Prod.	M
		Wattsburg	4/19/80	27	0	27	SI	M
	Phillipsville	Oennee	7/14/81	15,226	9,254	24,480	Prod.	M
	Reeds Corners		7/ 9/80	293,816	126,004	419,820	Prod. and SI	M
Erie and Warren..............	Brokenstraw		7/27/78	33,507	12,906	46,413	Prod. and SI	M
		Stroup	7/28/80	6,612	1,530	8,142	Prod.	M
	Union City	Bentley Run	10/13/80	8,955	8,865	17,820	Prod.	M
		Emmons	12/30/80	9,453	15,679	25,132	Prod.	M
Fayette......................	Feik		8/ 8/63	17,409	478	17,887	Prod.	0
	Mill Run		8/17/78	0	0	0	SI	0
		OuPree	8/23/80	0	0	0	Aban.	0
	Sandy Creek	Quebec Run	6/ 3/69	25,928	2,277	28,205	Prod.	0
	Spruell		10/13/61	7,830,087	186,060	8,016,147	Prod.	0
	Summit	North Summit	3/24/38	21,764,173	58,472	21,822,645	Prod. and aban.	0
		South Summit	5/ 9/42	22,817,980	92,561	22,910,541	Prod. and SI	0
Fayette and Somerset..........	Ohiopyle[4]		12/28/59	4,559,048	18,217	4,577,265	Prod., SI, and aban.	0
Fayette and Westmoreland......	Jacobs Creek	Bailey	12/26/61	2,280,266	50,486	2,330,752	Prod.	0
Indiana......................	Cherry Hill	Crichton	1/ 9/63	3,278,258	17,602	3,306,722	Prod.	0
		Hadden	7/11/63		10,862			
	Commodore	Wandin	5/12/81	0	167,783	167,783	Prod.	0
	Jacksonville	Jacksonville Oeep	11/17/56	30,379,848	118,763	30,498,611	Prod., SI, and aban.	0
	Lewisville	Serro	5/21/83	0	17,144	17,144	Prod.	N
	Living Waters	Uniontown	2/21/80	228,562	197,605	426,167	Prod.	0

Figure 21, *(Continued)*

County	Field	Pool	Discovery date	Cumulative production at end of 1982 (Mcf)[1]	Production 1983 (Mcf)[1]	Cumulative production at end of 1983 (Mcf)[1]	Status of field or pool at end of 1983[2]	Reservoir[3]
Indiana	Nolo	Carney Run	4/28/80	0	0	0	SI	O
		Nolo Deep	9/30/56	13,965,623	34,919	14,000,542	Prod., SI, and aban.	O
	Strongstown	Lizowitz	6/19/54	10,560,302	695,925	11,256,227	Prod.	O
		Pineton	12/20/69	11,719,372	691,280	12,410,652	Prod. and SI	O
Jefferson	Frostburg	Elk Run	6/30/65	48,996,258	201,123	49,197,381	Prod. and SI	O
Lawrence	Neshannock Creek		12/14/79	0	0	0	SI	M5
Lycoming	Salladasburg		6/24/76	36,123	0	36,123	SI	O
McKean	Bradford	Cyclone	2/18/74	1,412,139	82,864	1,495,003	Prod.	N
		Minard Run	1/10/75	13,200	0	13,200	SI	C
	Corydon		9/ 8/72	30,705	NA	30,705	NA	O
Mercer	Greenville	Thiel	10/28/81	0	4,087	4,087	Prod. and SI	M
	Hadley	Derber	9/13/81	154,830	NA	154,830	Prod.	O
		Perry School	8/30/81	21,254	19,833	41,087	Prod.	M
	Jamestown		1/18/79	43,790	6,522	50,312	Prod. and SI	M
	Maysville		11/11/77	21,724	1,937	23,661	Prod.	M
		West Salem	2/17/81	10,529	1,896	12,425	Prod.	M
	New Hamburg	Good Hope	2/ 2/79	23,936	5,677	29,613	Prod.	M
	Sandy Lake	Carpenter Corners	9/11/82	0	0	0	SI	M
		New Lebanon	1/27/83	0	0	0	SI	M
	Sharon	Sharon Deep	2/26/78	534,682	311,169	845,851	Prod. and SI	M
	Sheakleyville		5/12/81	159,850	195,253	355,103	Prod.	M
		Osborn	9/ 6/81	4,068	152,578	156,646	Prod.	M
	Stoneboro	Lake	3/ 2/83	0	0	0	SI	M
	Volant	Ligo	2/26/82	2,823	0	2,823	SI	M
		Pardoe	7/24/81	0	3,623	3,623	Prod. and SI	M
	Wheatland		7/24/63	500,472	105,370	605,842	Prod.	M
	Wolf Creek	Black Run	12/29/81	0	1,872	1,872	Prod. and SI	M
		Kilgore	10/26/66	955,035	65,698	1,020,733	Prod.	L
Mercer and Venango	Utica	French Creek	7/26/81	0	0	0	SI	M
Potter	Ulysses		10/ 2/39	4,505,943	18,735	4,567,466	Prod.	O
		Newfield	4/ 2/62		42,788			
Somerset	Bakersville		1/14/79	483,082	49,201	532,283	Prod. and SI	O
	Boswell		11/11/58	11,609,760	161,776	11,796,658	Prod. and SI	O
		Edie	10/18/68		4,368			
		Snyder	6/16/60		20,754			
	Brier Knob		7/ 4/80	0	0	0	SI	O
	Heckman Hollow		8/16/77	1,083,549	538,738	1,622,287	Prod.	O
	Kimmel		5/ 9/80	369,717	78,749	448,466	Prod.	O
	Kings Bridge		3/29/81	0	0	0	SI	O
	Rockwood		5/28/79	408,363	17,053	425,416	Prod.	O
		Gebhart	11/26/79	0	0	0	Aban.	O
	Shade Creek		10/ 3/77	396,391	351,705	748,096	Prod.	O
	Shamrock		5/10/79	2,071,498	161,407	2,232,905	Prod.	O
	Shanksville		9/22/73	4,904,270	302,103	5,206,373	Prod. and aban.	O
	Somerset East		10/ 7/79	0	425,423	425,423	Prod.	O
	Somerset West		1/ 6/78	1,095,425	288,834	1,384,259	Prod.	O
Tioga	South Wellsboro		2/ 2/82	0	0	0	SI	O
Venango	Barkeyville	Duncan	4/ 5/73	127,808	4,170	131,978	Prod.	M
	Cooperstown	Beatty Run	7/30/82	0	61,420	61,420	Prod. and SI	M
	Foster-Reno	Coal City	2/16/82	0	0	0	SI	M
		Victory Run	2/ 1/82	0	0	0	SI	M
	Franklin-Oak Forest	Galloway	11/12/73	70,131	0	70,131	SI	M
	McCune Run	Canal	5/25/82	88,555	266,875	355,430	Prod. and SI	M
	Sugar Creek-Niles	Takitezy	7/26/82	0	0	0	SI	M
	Wesley	Irwin	12/ 1/72	328,944	14,803	343,747	Prod. and SI	M
Warren	Columbus	Dewey Corners	2/10/81	65,721	285,917	351,638	Prod.	M
		Whites Run	10/30/75	13,300	72,224	85,524	Prod.	M

	Goodwill Hill-Grand Valley	Campbell Creek	11/14/81	0	NA	0	NA	M
	Sanford	Trimm	2/19/81	3,614	46,136	49,750	Prod.	M
	Selkirk	Three Bridge	2/29/81	9,178	36,933	46,111	Prod.	M
	Stillwater		9/26/79	236,927	171,678	408,605	Prod. and SI	M
		Freehold	8/ 5/80	161,595	120,387	281,982	Prod.	M
		Savko	9/ 5/80	281,840	102,991	384,831	Prod.	M
	Sugar Grove	Loucks	5/ 3/81	0	0	0	SI	M
		Mikrut	7/21/81	0	3,143	3,143	Prod., SI, and aban.	M
	Youngsville	Blue Eye	11/ 3/80	0	NA	0	NA	M
		Pikes Rocks	5/ 1/81	14,666	30,028	44,694	Prod.	M
Washington....................	Buffalo	Garrett Hill	6/15/82	0	7,216	7,216	Prod.	MS
	Lone Pine	Glyde	9/ 6/61	147,045	1,632	148,677	Prod.	O
Westmoreland.................	Crabtree	Dry Ridge	8/25/46	6,235,801	113,431	6,349,232	Prod. and aban.	O
	Linn Run		4/25/79	108,916	115,890	224,806	Prod.	O
	Lycippus	TOTAL	8/17/49	6,714,811	36,455	6,751,266	Prod.	O
		St. Boniface Chapel	9/13/56	5,975,383	36,455	6,011,838	Prod.	O
	Murrysville	TOTAL	11/ 3/1878	778,920	0	778,920	Prod.	O
		Duquesne	8/ 8/65	650,803	0	650,803	Prod.	O
	New Alexandria	Kahl	10/23/62	11,272,556	98,701	11,371,257	Prod.	O
		Keystone	7/10/81	36,693	28,394	65,087	Prod.	O
Westmoreland and Somerset.....	Johnstown	Baldwin	5/22/60	12,002,504	116,393	12,369,693	Prod.	O
		Beck	5/16/57		250,796			
		Williams	2/14/58	19,070,769	125,566	19,196,335	Prod.	O
	Seven Springs	TOTAL	12/ 5/58	8,030,213	206,467	8,236,680	Prod.	O
		Blair Oriskany	12/ 5/58	6,540,321	26,633	6,595,064	Prod.	O
		Tunnel	3/10/65		28,110			
		Myersbrook	7/16/82	0	133,722	133,722	Prod.	O
		Seven Springs	8/ 3/66	777,469	18,002	795,471	Prod.	O

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[1] Mcf = thousand cubic feet.

[2] Aban. = abandoned; gas stor. = gas storage; prod. = producing; and SI = shut-in.

[3] MS = Marcellus Shale; N = Onondaga Formation; O = Oriskany Sandstone; H = Helderberg Group/Bass Islands Dolomite; S = Salina Group; L = Lockport Dolomite; M = Medina Group; T = Tuscarora Formation; BE = Bald Eagle Formation; C = Cambrian formations.

[4] Includes Rugg pool.

Figure 22. Deep gas production in Pennsylvania in 1983 by producing formation.

Producing formation	Cumulative production at end of 1982 (Mcf)[1]	Production in 1983 (Mcf)[1]	Cumulative production at end of 1983 (Mcf)[1]
Marcellus Formation (deep black shale)	10,000	15,216	25,216
Onondaga Limestone	1,415,122	100,087	1,515,209
Oriskany Sandstone, Huntersville Chert, and Ridgeley Formation	1,251,591,775	7,471,346	1,259,063,121
Bass Islands Dolomite and Helderberg Group	12,133	0	12,133
Salina Group	0	2,631	2,631
Lockport Dolomite	957,665	65,698	1,023,363
Medina Group	77,575,958	19,343,679	96,919,637
Tuscarora Sandstone	1,827,304	612,304	2,439,609
Bald Eagle Formation	0	312,100	312,100
Gatesburg Formation and Little Falls Dolomite	203,200	0	203,200
TOTAL	1,333,593,157	27,923,061	1,361,516,219

[1] Mcf = thousand cubic feet.

the year by 57 percent, from 214 wells reported in 1982 to 122 wells reported in 1983. The success rate for these wells was 88 percent, which is a small increase.

DEVELOPMENT WELLS

A development well is one that is drilled within a proven area of production to a known productive stratigraphic horizon. A producing well in such an area and reservoir is classified as an oil or gas development well. It is considered a dry development well if it is not completed for production. Development drilling in Pennsylvania in 1983 decreased by 39 percent, from 3,828 wells in 1982 to 2,340 wells in 1983. The success rate for all development drilling remained at the 98 percent level set in 1982.

Figure 23. Production, unit price, and total value of crude oil and natural gas produced in Pennsylvania, 1960–83.

	CRUDE OIL			NATURAL GAS			Total oil and gas value (dollars)
Year	Production[1] (bbl)	Average yearly price (dollars/bbl)	Total value (dollars)	Production[2] (Mcf)[4]	Average yearly price[3] (dollars/Mcf)[4]	Total value (dollars)	
1960	5,942,000	4.57	27,154,940	119,671,000	0.26	31,114,460	58,269,400
1961	5,580,000	4.76	26,560,800	98,318,000	0.26	25,562,680	52,123,480
1962	5,238,000	4.63	24,251,940	87,308,000	0.26	22,700,080	46,952,020
1963	5,014,000	4.63	23,214,820	92,340,000	0.26	24,008,400	47,223,220
1964	5,113,000	4.48	22,906,240	85,322,000	0.26	22,183,720	45,089,960
1965	4,859,000	4.20	20,407,800	82,668,000	0.26	21,493,680	41,901,480
1966	4,349,000	4.33	18,831,170	91,365,000	0.26	23,754,900	42,586,070
1967	4,409,000	4.35	19,179,150	89,966,000	0.26	23,391,160	42,570,310
1968	4,160,000	4.35	18,096,000	87,987,000	0.28	24,636,360	42,732,360
1969	4,448,000	4.29	19,081,920	79,134,000	0.26	20,574,840	39,656,760
1970	4,015,000	4.27	17,144,050	77,535,000	0.27	20,934,450	38,078,500
1971	3,798,000	4.47	16,977,060	76,451,000	0.30	22,935,300	39,912,360
1972	3,441,000	4.60	15,828,600	73,958,000	0.45	33,281,100	49,109,700
1973	3,282,000	5.73	18,805,860	78,514,000	0.45	35,331,300	54,137,160
1974	3,399,000	8.43	28,653,570	82,735,000	0.50	41,367,500	70,021,070
1975	3,199,000	9.26	29,622,740	84,772,000	0.80	67,817,600	97,440,340
1976	2,950,000	11.51	33,954,500	89,974,000	0.85	76,477,900	110,432,400
1977	2,659,000	14.22	37,810,980	92,293,000	1.00	92,293,000	130,103,980
1978	2,820,000	14.77	41,651,400	97,763,000	1.25	122,203,750	163,855,150
1979	2,817,000	23.67	66,678,390	96,313,000	1.40	134,838,200	201,516,590
1980	2,940,000	37.42	110,014,800	97,439,000	1.50	146,158,500	256,173,300
1981	3,729,000	36.33	135,474,570	122,454,000	2.00	244,908,000	380,382,570
1982	4,282,000	31.42	134,540,440	121,111,000	2.80	339,110,800	473,651,240
1983	4,491,000	28.18	126,556,380	118,372,000	3.00	355,116,000	481,672,380

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[1] Oil production figure courtesy of the American Petroleum Institute Crude Oil Reserve Committee and the Penn Grade Crude Association.

[2] Gas production figure courtesy of the American Gas Association.

[3] Gas prices estimated only.

[4] Mcf = thousand cubic feet.

Figure 24. Exploratory and primary development and drilling footages reported, 1983 and 1982.

Type of well	1983 Wells	1983 Footage	1982 Wells	1982 Footage	% Change in footage
Exploratory					
Gas	94	467,918	157	750,802	
Oil	10	15,413	23	33,577	
Oil and gas	3	9,656	0	0	
Dry	15	47,066	34	128,805	
Total (% successful)	122 (88%)	540,053	214 (84%)	913,184	- 41
Development					
Gas	836	3,019,933	1,577	5,989,396	
Oil	1,426	1,547,956	2,152	2,189,785	
Oil and gas	30	60,008	24	63,657	
Dry	48	81,058	75	135,268	
Total (% successful)	2,340 (98%)	4,708,955	3,828 (98%)	8,378,106	- 44
Miscellaneous wells					
Service	78	142,837	182	211,806	- 33
TOTAL ALL WELLS DRILLED	2,540 (98%)	5,391,845	4,224 (97%)	9,503,096	- 43

Figure 24 summarizes drilling activity in Pennsylvania in 1983 as exploratory, development, or service. Figure 25 shows the breakdown of exploratory drilling by classification. All exploratory successes and the more important exploratory failures of 1983 are illustrated in Figure 26, and these wells are listed in Figures 27 and 28.

Figure 25. Exploratory drilling in Pennsylvania by classification and type of well, 1983.

Classification and type of well	No. of wells	Footage
NEW FIELD WILDCATS		
Gas	6	44,891
Dry	8	11,038
Subtotal	14	55,929
NEW POOL WILDCATS		
Gas	11	44,667
Oil	1	1,838
Subtotal	12	46,505
DEEPER POOL TESTS		
Gas	10	60,442
Oil	1	1,596
Dry	1	5,004
Subtotal	12	67,042
SHALLOWER POOL TESTS		
Gas	2	2,500
Oil and gas	2	4,351
Subtotal	4	6,851
OUTPOST EXTENSIONS		
Gas	64	310,414
Oil	8	11,979
Oil and gas	1	5,305
Dry	7	36,028
Subtotal	80	363,726
GRAND TOTAL EXPLORATORY WELLS	122	540,053

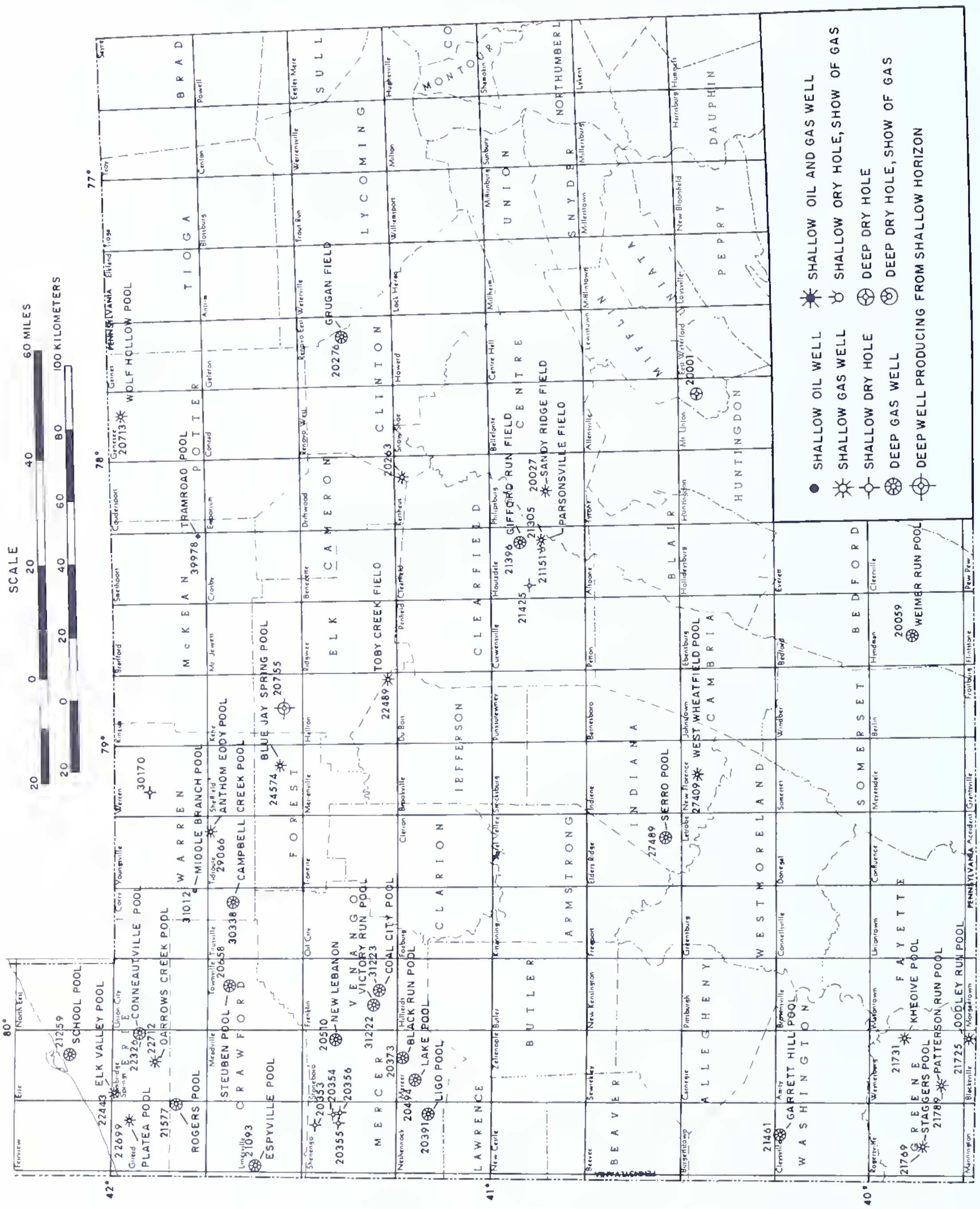

Figure 26. Map of exploratory wells in Pennsylvania reported in 1983.

Figure 27. Reported new field and new pool discoveries in Pennsylvania, 1983.

County and permit no.	Quadrangle	Operator well no. and lease	Completion date (M-Day-Y)	Total depth (feet)	Name of formation at T.D.¹	Prod. depth (feet)	Prod. formation or zone¹	Initial daily prod. (in Mcf² except where noted)	Field or pool name	Explor. class³
Bedford BEO-20059	Chaneysville	Columbia Gas Transmission Corp. #1 Cletus Mallow	11- 1-82	6,495	Helderberg Gp. (O)	6,453	Ridgeley (D)	310	Weimer Run pool	NPD
Centre CEN-20027	Sandy Ridge	Eastern States Exploration Co. #1 Commonwealth of PA TR-242	2- 8-83	7,003	Lock Haven (D)	6,860	Lock Haven (O)	179	Sandy Ridge field	NFD
Clearfield CLE-21305	Houtzdale	Eastern States Exploration #2 Power Land Company	4-12-82	4,605	Lock Haven (D)	3,126	Lock Haven (D)	20	Parsonsville field	NFD
Clearfield CLE-21396	The Knobs	Adobe Oil and Gas Corporation Commonwealth of PA Tract #324	1-13-83	7,355	Helderberg Gp. (D)	7,218	Ridgeley (D)	5,729	Gifford Run field	NFO
Clinton CLI-20263	Pottersdale	Joseph Broda (Bee Sting 25) #BS-25 Hamburger	7- ?-81	2,975	Lock Haven (O)	2,355	Lock Haven (D)	15	Unnamed (noncommercial)	NFW
Clinton CLI-20276	Glen Union	Texaco, U.S.A. #1 PA State Forest Tract 285	8-12-82	19,365	Pleasant Hill (C)	13,030	Bald Eagle (O)	3,847	Grugan field	NFD
Crawford CRA-20658	Centerville	Wainoco Oil and Gas Corporation #1 Frank Trepaso	12-22-79	5,325	Queenston (O)	5,180	Medina Gp. (S)	116	Steuben pool	NPD
Crawford CRA-21093	Hartstown	POI Energy, Incorporated #1 Hirschmann	2- 8-81	4,300	Queenston (O)	4,054	Medina Gp. (S)	40	Espyville pool	NPD
Crawford CRA-21577	Conneautville	Atlas Resources, Inc. #1 Thomas J. Rogers	4- 8-82	3,930	Queenston (O)	2,650	Oriskany (O)	2,200	Rogers pool	NPD
Erie ERI-21259	Erie South	Moody and Associates, Inc. #1 Erie Technical Memorial School	3-26-81	1,810	Oriskany (D)	1,800	Oriskany (O)	3,500	School pool	NPO
Erie ERI-22326	Cambridge Springs NE	Vineyard Oil and Gas Company #2 John Rutkowski	10-14-82	3,340	Salina Gp. (S)	3,340	Salina Gp. (S)	3,000	Conneauttee pool	SPD
Erie ERI-22443	Edinboro North	William T. Hodges #1 William T. Hodges	12-22-82	903	Ohio (O)	856	Ohio (D)	4	Elk Valley pool (noncommercial)	NPO
Erie ERI-22699	Albion	Identification Systems, Inc. #1 Identification Systems	3-12-83	1,000	Ohio (O)	950	Ohio (D)	27	Platea pool (noncommercial)	SPO
Erie ERI-22712	Cambridge Springs NE	First United Presbyterian Church First United Presbyterian Church	4-10-83	1,500	Ohio (D)	1,275	Ohio (D)	23	Oarrows Creek pool (noncommercial)	SPD
Forest FOR-24574	Lynch	Quaker State Oil Refining Corp. #20 Bluejay (OSORC-405)	9-30-82	2,088	Bradford Gp. (D)	2,033	Bradford Gp. (O)	40	Blue Jay Spring pool	NPD
Greene GRE-21725	Osage	Carnegie Natural Gas Company #1 A. J. Barker	9-14-82	6,010	Elk Gp. (D)	4,115	Bradford Gp. (D)	315	Dooley Run pool	OPD
Greene GRE-21731	Mather	Kepco, Incorporated #PK-30 Samuel Yareck	10-18-82	5,925	Elk Gp. (O)	4,399	Elk Gp. (D)	84	Khedive pool	DPD
Greene GRE-21769	New Freeport	Union Drilling, Inc. #1 Paul W. Huffman	12 -1-82	5,620	Elk Gp. (D)	5,052	Elk Gp. (O)	267	Staggers pool	DPD
Greene GRE-21789	Oak Forest	Kepco, Incorporated #2 J. K. Willison	11-14-82	5,990	Elk Gp. (O)	5,929	Elk Gp. (O)	273	Patterson Run pool	DPD

Figure 27. *(Continued)*

County and permit no.	Quadrangle	Operator well no. and lease	Completion date (M-Day-Y)	Total depth (feet)	Name of formation at T.D.[1]	Prod. depth (feet)	Prod. formation or zone[1]	Initial daily prod. (in Mcf[2] except where noted)	Field or pool name	Explor. class[3]
Indiana IND-27409	New Florence	North Cambria Fuel Company #2 Martin L. Bearer - McGraw Tr.	2-22-83	3,696	Elk Gp. (D)	3,642	Elk Gp. (D)	81	West Wheatfield pool	DPD
Indiana IND-27489	McIntyre	J and J Enterprises, Inc. #1 Martin Serro	5-21-83	7,815	Helderberg Gp. (D)	7,555	Huntersville Chert (D)	3,033	Serro pool	DPD
Jefferson JEF-22489	Carman	Eastern States Exploration #1 Humphrey Industries, Inc.	2-19-82	3,588	Bradford Gp. (D)	3,207	Bradford Gp. (D)	30	Toby Creek field	NFD
McKean MCK-39978	Port Allegany	Quaker State Oil Refining Corp. #01 Gittleman	11- 6-82	1,838	Elk Gp. (D)	1,660	Bradford Gp. (D)	Not reported	Tramroad pool	NPD
Mercer MER-20373	Grove City	DorSo Energy #1 Richard Ligo	12-29-81	6,385	Medina Gp. (S)	6,026	Medina Gp. (S)	80	Black Run pool	DPD
Mercer MER-20391	Greenfield	DorSo Energy #1 Robert S. Moose	2-26-82	6,176	Queenston (D)	5,941	Medina Gp. (S)	164	Ligo pool	NPD
Mercer MER-20494	Jackson Center	Mitchell Energy Corporation #1 R. and M. McKean	3- 2-83	5,862	Queenston (O)	5,778	Medina Gp. (S)	613	Lake pool	DPD
Mercer MER-20510	New Lebanon	Mitchell Energy Corporation #1 F. L. Shearer	1-27-83	5,784	Queenston (D)	5,684	Medina Gp. (S)	620	New Lebanon pool	NPD
Potter POT-20713	Ulysses	Classen Exploration, Inc. #1 Brian G. Kelly	1-11-83	1,011	Lock Haven (D)	929	Lock Haven (D)	244 10 bbl	Wolf Hollow pool	SPD
Venango VEN-31222	Polk	DorSo Energy #1 Gwendolyn J. Radko	2- 1-82	6,508	Queenston (D)	6,265	Medina Gp. (S)	80	Victory Run pool	DPD
Venango VEN-31223	Kennerdell	DorSo Energy #1 William J. Thompson	2-16-82	6,655	Queenston (O)	6,437	Medina Gp. (S)	240	Coal City pool	NPD
Warren WAR-29066	Cobham	Joseph Mikula #2 Joseph Mikula	4-19-81	1,201	Bradford Gp. (D)	1,099	Bradford Gp. (D)	?	Althom Eddy pool	NPD
Warren WAR-30338	Grand Valley	Berea Oil and Gas Corporation #1 A. A. and M. Flick	11-14-81	5,727	Queenston (D)	5,610	Medina Gp. (S)	1,100	Campbell Creek pool	DPD
Warren WAR-31012	Spring Creek	Interpen Drilling Company #J-19 Johnson (IDCI-9)	4- 6-82	1,596	Bradford Gp. (D)	1,493	Bradford Gp. (D)	? bbl	Middle Branch pool	DPD
Washington WAS-21461	Washington West	Gary E. Schodorf #1 Anna Johnson	7-23-82	6,829	Huntersville Chert (D)	6,657	Marcellus (D)	15	Garrett Hill pool	DPD

[1] (D) = Devonian; (S) = Silurian; (O) = Ordovician; (C) = Cambrian.

[2] Mcf = thousand cubic feet.

[3] NFD = new field discovery; NPD = new pool discovery; DPD = deeper pool discovery; SPD = shallower pool discovery.

Figure 28. Selected exploratory failures reported in Pennsylvania, 1983.

County and permit no.	Quadrangle	Operator well no. and lease	Completion date (M-Day-Y)	Total depth (feet)	Name of formation at T.D.[1]	Explor. class[2]
Clearfield CLE-21151	Houtzdale	Eastern States Exploration Co. #1 Power Land Company	3-17-82	4,502	Lock Haven (D)	NFW
Clearfield CLE-21425	Glen Richey	Consolidated Gas Supply Corp. #1 J. M. Chase	9-22-82	3,370	Elk Group (D)	NFW
Elk ELK-20755	James City	Penn-Cal Contractors, Inc. #9110 Hanley-Bird	9-20-81	5,004	Marcellus (D)	DPT[3]
Mercer MER-20353	Greenville East	Frederick Drilling Company #L-1 Clyde and Dorothy Lean	12-29-81	395	Cussewago (M)	NFW
Mercer MER-20354	Greenville East	Frederick Drilling Company #B-1 Phillip K. Blauser	12-22-81	374	Cussewago (M)	NFW
Mercer MER-20355	Greenville East	Frederick Drilling Company #C-1 Laverne E. Clark	12-20-81	400	Cussewago (M)	NFW
Mercer MER-20356	Greenville East	Frederick Drilling Company #Y-1 Earl A. Young	12-17-81	372	Cussewago (M)	NFW
Mifflin MIF-20001	Newton Hamilton	Floyd A. Gearhart #1 Daniel Sechrist	10- 2-82	476	Oriskany (D)	NFW
Warren WAR-30170	Russell	Quaker State Oil Refining Corp. #01 Wenzel (QSORC-362)	5-24-82	1,149	Bradford Group (D)	NFW

[1] (M) = Mississippian; (D) = Devonian.
[2] NFW = new field wildcat; DPT = deeper pool test.
[3] Dry deeper pool test completed as shallow gas well.

HIGHLIGHTS OF 1983 EXPLORATION AND DEVELOPMENT

Drilling in the Upper Devonian Venango Group reservoirs (Figure 29) has typically been almost restricted to the western counties of Pennsylvania, and the majority of this drilling has taken place in the oil fields of Venango, Warren, Forest, and Clarion Counties. Some good open flows (and subsequent

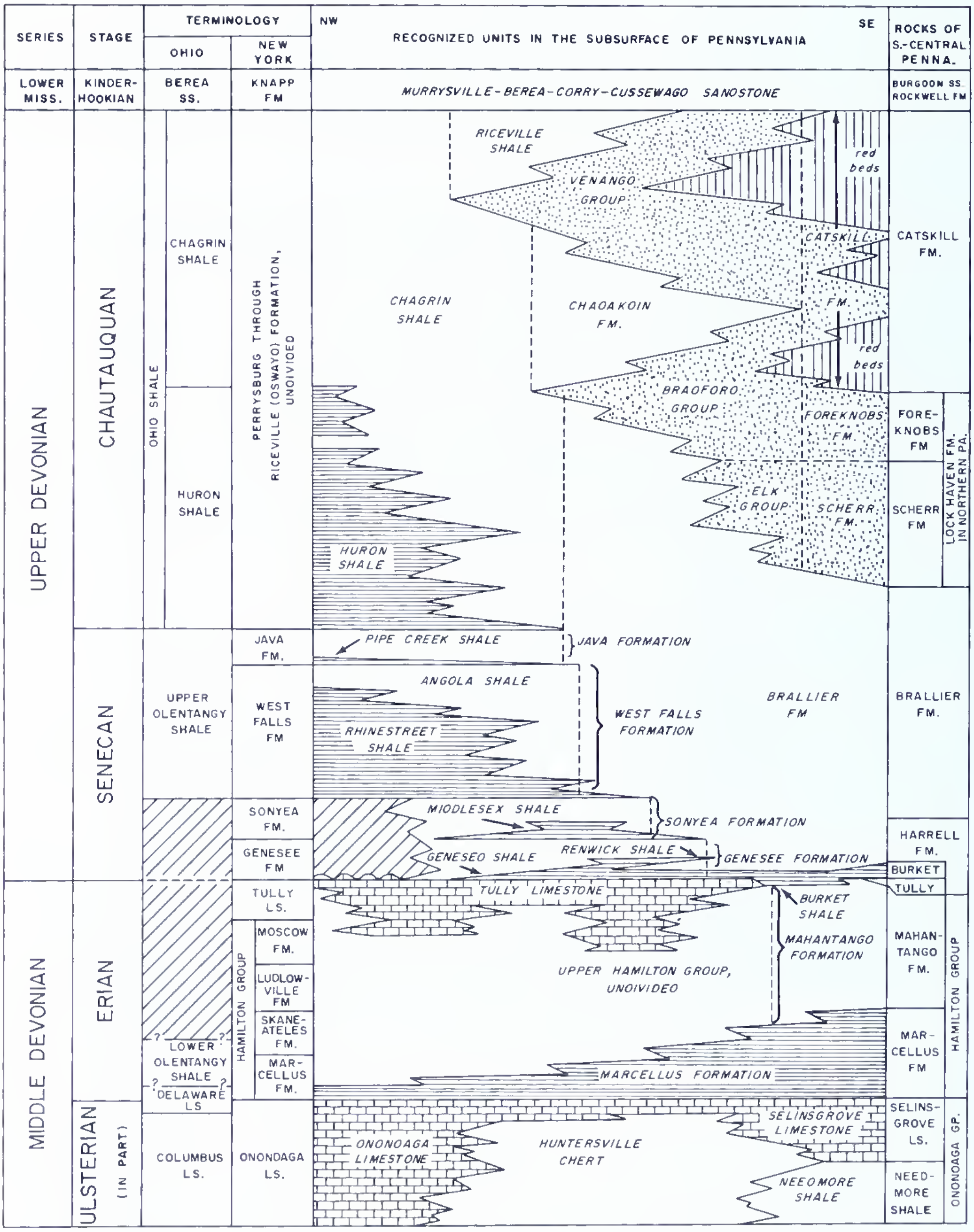

Figure 29. Schematic diagram of Upper and Middle Devonian stratigraphic units from the surface and subsurface of western Pennsylvania.

production) have been discovered recently in disparate areas of the main gas-producing belt, however, in areas of traditional Bradford Group production. Recent discoveries in Indiana and Clearfield Counties, for example, point out the potential for Venango Group gas wells in these areas. Other Venango Group drilling of interest occurred in some of the older, largely ignored areas of southwestern Pennsylvania. Fayette County, in particular, has been actively drilled for lower Venango and middle Bradford targets for the last two or three years. These Venango Group targets, especially the Fifth Stray, Bayard, and Elizabeth sands, represent some interesting trends in the Highhouse field area. It is hoped that this activity continues and extends westward into Greene and Washington Counties.

Most of the shallow gas-well drilling (and some interesting shallow oil drilling) in Pennsylvania in 1983 was targeted in the Bradford Group reservoirs, including the discovery of several small pools in the northern counties (Figures 26 and 27). Some of the more interesting Upper Devonian activity was in high-porosity and -permeability Bradford zones in the eastern edge of the traditional fields. Continued success in the Kane sand play of Indiana County (Cush Cushion field) was extended into Clearfield and Cambria Counties in the past few years. Subsequent drilling farther east in Cambria County extended the limits of this trend, but also resulted in finding similar production in higher reservoirs such as the Bradford sand. In Clearfield County, the trend of production in the Lumber City and Grampian fields area appears to be basically north-south, and may be due to increased permeability in the Tiona and Sheffield sands. Operators are actively pursuing the possibility of similar trends throughout the area.

A well drilled through the Speechley sand in the Pine Run field, Upper Burrell Township, Westmoreland County, produced oil from the Bradford Group sands. Many Upper Devonian gas wells produce a little oil, even in such non-oil areas as Indiana and Westmoreland Counties (see Figure 2). This well, however, is the first well purporting to be an oil producer in this area since early in the 1900's. The W & B Oil Company #1 Vlasic had a natural open flow of 7 Mcf, and after fracking flowed 150 Mcf at 940 psi. The well produced 10 bbl of oil along with the gas. Both gas and oil are from the Speechley and Speechley Stray sands at about 3,200 feet. Future drilling in this area may prove that the possibilities are good for additional oil production.

Other Upper Devonian activity in 1983 included four Elk Group and four Lock Haven Formation field and pool discoveries. None of the Elk Group discoveries was of great significance, representing simply deeper drilling in the shallow gas fields of Greene County. The greatest significance of these discoveries was simply that commercial quantities of gas can be found in the Elk Group siltstones throughout large areas of southwestern Pennsylvania. The Lock Haven Formation has been the target of one or two companies in Centre County for the past two or three years. As with the Elk Group wells, open flows are small, too small to attract a large number of drillers, but the gas is available in commercial quantities. Only 10 Lock Haven wells were reported in 1983, and it is not likely that larger numbers are to be expected in the future.

Upper and Middle Devonian black-shale activity picked up at a near-furious pace in 1983; 85 wells were reported during the year. These wells are primarily domestic wells, less than 1,500 feet deep, and drilled within 5 miles of the Lake Erie shoreline in Erie County. Most wells produce from the Huron and Rhinestreet shales of the Upper Devonian, but a few were drilled to and produced from the Middle Devonian Marcellus Formation as well. Four new pool discoveries, including three in the Ohio Shale of Erie County and one in the Marcellus Formation of Washington County, were reported in 1983. The Washington County discovery, Garrett Hill pool in the Buffalo field, was not a large one. The discovery well, Gary Schodorf #1 Anna Johnson, was originally drilled to the Huntersville Chert, but was unresponsive to stimulation. After restimulation in the Marcellus, the well flowed only 15 Mcfgpd, but was put on line. Two other Marcellus wells drilled in the vicinity provided somewhat larger open flows, but the potential for economical Marcellus production does not appear to be encouraging.

The Middle Devonian Huntersville Chert generally produces in Pennsylvania in conjunction with the Ridgeley Formation. Occasionally, however, the Huntersville becomes the primary, or sole, reservoir. This occurred in 1983 when J & J Enterprises of Indiana County discovered the Serro pool in the shallow Lewisville field. The discovery well was a deeper pool test of a Huntersville-Ridgeley trend (the Jacksonville Deep pool, Jacksonville field) along the Grapeville-Kinter Hill anticline to the north. The well flowed 3,033 Mcf at 7,555 feet, indicating that there is still a lot of gas to be produced from extensions of the Huntersville and/or Ridgeley fields of the Indiana-Westmoreland County area.

Ridgeley-Oriskany production, drilling, and exploration in Pennsylvania has become subdued in the past 10 or 15 years. The large drilling programs apparent in the 1950's and 1960's have given way to an occasional well drilled here or there. Only six wells were drilled to Ridgeley or Oriskany targets in 1983, but four of these were discovery wells. Ridgeley discoveries included the Columbia Gas #1 Mallow in Bedford County, a well off the main structural trend of the Five Forks field. This well discovered the Weimer Run pool at 6,453 feet and had an open flow of 310 Mcfgpd. The Adobe Oil and Gas #1 Commonwealth of PA Tract #324 in Clearfield County was a 7,218-foot test located about 5 miles southeast of the Punxsutawney-Driftwood field. The well discovered the Gifford Run field and had an open flow of 5,729 Mcfgpd. Oriskany fields and pools in northwestern Pennsylvania tend to be accidental discoveries—wells completed in the Oriskany Sandstone where a deeper formation was the original target. The two

Oriskany discoveries reported in 1983 fall into this category. The Atlas Resources #1 Rogers, Crawford County, was another of the seemingly numerous, isolated Oriskany wells in the Conneaut field. The well was drilled to the Queenston (Upper Ordovician) with the prospect of producing gas from the Lower Silurian Medina Group. However, Atlas completed the well in the Oriskany with an open flow of 2,200 Mcfgpd. The second Oriskany discovery, the School pool in Erie County, was actually made in 1981, but it took two years for completion of the paperwork. The Moody and Associates #1 Erie Technical Memorial School was originally scheduled as a test of the Medina Group, but at 1,800 feet the drill bit penetrated a porous zone in the Oriskany that produced an estimated 3,500 Mcfgpd natural open flow. Inasmuch as the well was originally planned as a domestic well to meet the school's needs, even the erratic or rapidly deteriorating flows typical of the Oriskany in northwestern Pennsylvania should be sufficient. The Survey received reports during the year that others were interested in trying to establish trends in the Oriskany in this area. Given the history of Oriskany drilling and production in terms of depositional patterns, gas flow, and salt-water flooding in northwestern Pennsylvania, establishing potential trends in this "reservoir" is unlikely to be successful. Operators are encouraged, however, to evaluate the Oriskany section (where it occurs) in their wells before abandoning it as an unlikely reservoir.

In 1981, operators in Chautauqua County, New York, discovered a trend in the Upper Silurian-Lower Devonian Bass Islands Dolomite which has drawn much attention. The high-potential oil and gas wells (the discovery well blew out, but was reported to have produced oil at the rate of about 200 barrels per day) apparently follow a trend which suggests fractured reservoirs along a known fault system extending from Erie County, New York, to Erie County, Pennsylvania. Although the fault system and its inherent production potential are suggested to extend into Pennsylvania, the system has not yet been conclusively identified and traced in the Commonwealth. A Bass Islands well drilled in Erie County in 1982 may have been along this trend, but this has not been established with any certainty. In 1983, Vineyard Oil and Gas Company reported a well in the Upper Silurian Salina Group which, like the Goe Pro #1 Loomis well in the Bass Islands Dolomite the previous year, may be along the New York fault system. Unlike the Bass Islands well, the Vineyard #2 Rutkowski is in the eastern part of Erie County nearer to New York. The driller encountered an estimated open flow of 3,000 Mcfgpd from the (questionable) top of the Salina Group at 3,340 feet. There are no logs available on this well, and the designation of Salina is questionable simply because of the difficulty many drillers have in picking formation tops in Erie and Crawford Counties, especially in the interval between the base of the Onondaga limestones and the top of the Salina evaporites.

Although, overall, deep drilling decreased from 1982 to 1983, deep exploratory and development drilling remained concentrated in the Lower Silurian Medina Group, continuing the trend set in the late 1970's. Expectation of, and subsequent designation of, the Medina as a tight formation by the Federal Energy Regulatory Commission in 1981 spurred drilling in the late 1970's and 1980's, but the decline in the economy and a subsequent shut-in of gas wells by the utilities and pipeline companies led to a significant decline in Medina drilling in the second half of 1982, particularly in previously developed areas. The slump was still apparent in 1983 and is likely to continue at least into 1984. As such, only nine Medina pools were reported as new discoveries in 1983, mostly as deeper pool tests in otherwise shallow Upper Devonian or Mississippian fields. None was an outstanding discovery.

Probably the most significant discovery reported in 1983 was the Texaco #1 PA State Forest Tract 285 well, drilled and completed in Clinton County in 1982. This well, the discovery well of the Grugan field, flowed 3,847 Mcfgpd from the Upper Ordovician Bald Eagle Formation at 13,030 feet, thereby establishing both a new reservoir and a new production depth record for Pennsylvania. The well was originally drilled to the Middle Cambrian Pleasant Hill Formation at 19,365 feet, but apparently missed the proposed target, a deep-seated block fault postulated from seismic surveys. After evaluating the potential pay zones, Texaco perforated and acidized a 130-foot section in the Bald Eagle. The first try was unsuccessful, and a second attempt netted the reported open flow. Texaco filed for tight formation designation on the Bald Eagle in a two-county, three-township area. Although no other wells have been drilled and no other permits have been issued in the area, several operators have expressed interest in this potential new reservoir and will probably drill when funds are available.

GEOPHYSICAL ACTIVITY IN PENNSYLVANIA

The seismograph is the principal nondrilling exploratory tool used in Pennsylvania for the exploration of oil and gas. The use of seismic tools is advantageous in that it can give approximate to excellent indications of the attitude of rocks (whether they are folded, faulted, tilted, or flat lying) and the depth of potential hydrocarbon reservoirs by measuring the travel time for vibrations generated at the surface to reach the rock. Mechanically generated seismic pulses, especially Vibroseis, and explosive techniques, principally dynamite, are the most widely used in Pennsylvania. Seismic work is typically performed by contracted crews, and the intensity of activity is measured in crew-months.

Seismic activity in Pennsylvania decreased in 1983, down 31 percent to 23.6 crew-months from the 34 crew-months reported in 1982. It is estimated that use of Vibroseis accounted for 16.6 crew-months and dynamite for 7 crew-months of seismic activity. Companies involved in seismic activity included major oil companies, large independents, and small independents; they were Adobe Oil and Gas, Arco Oil and Gas, Cabot Oil and Gas, Columbia Gas Transmission, CNG Development, Exxon, Mitchell Energy, National Fuel Gas, Pennzoil, and Sun Exploration. Surveys were reported in Blair, Bradford, Bucks, Cambria, Clearfield, Clinton, Crawford, Dauphin, Elk, Greene, Huntingdon, Indiana, Jefferson, Juniata, Lycoming, McKean, Mercer, Mifflin, Montgomery, Montour, Northumberland, Potter, Snyder, Tioga, Union, Warren, Washington, and Westmoreland Counties. Seismic surveys cost the participating companies approximately $5,900,000 in 1983, averaging $250,000 per crew per month.

ACTIVITIES ON STATE FOREST AND PARK LANDS

Total income from oil and gas activities on Pennsylvania State Forest and Park lands during 1983 amounted to $2,927,299. This income came from rentals, including bonuses from lease sales, royalties, gas storage rentals, pipeline and compressor station rentals, and seismic surveys. Royalty payments for the year amounted to $409,422 for 1,181,791 Mcf of gas produced on State land or from unitized acreage. Rentals for existing exploratory acreage and past leasing programs totaled $1,770,915, and gas storage rentals totaled $733,495. Other income for seismic surveys and for pipeline and compressor station rentals totaled $13,467.

During 1983 there were two lease sales totaling 238,267 acres held for bid by industry. Only the first sale, in June, was placed under lease during the year. In this sale, 87,972 acres were offered but only 63,342 acres were bid upon and placed under lease. The acreage bid on in the second sale, in December, will be placed under lease in 1984.

At the end of 1983 a total of 804,712 acres of State Forest and Park lands was under lease for oil and gas exploration and development, and 100,493 acres was under lease for gas storage.

PROJECTS IN PROGRESS IN 1983, OIL AND GAS GEOLOGY DIVISION

COMBINED REVISION OF FILING AND BASE-MAP PROCEDURES

The Pennsylvania Geological Survey completed its 15-minute base map series in 1981, and in 1982 began a program of revision that includes not only the base maps, but also the well-record system. The revision program, which is expected to take three to five years to complete, includes: (1) conversion of the oil and gas well-record files from the old Survey file-number system to the more realistic permit-number system used by the Bureau of Oil and Gas Management and other state agencies; and (2) modification of the completed oil and gas base-map series from 15-minute scale to 7½-minute scale. The present base maps each encompass four 15-minute (1:62,500 scale) topographic maps but show only a 5-minute grid system, quadrangle names, county boundaries, and the major waterways and towns as background. The new base maps will be topographic maps at a scale of 1:24,000 and will each represent 1/16 of the area covered by an old base map. The two phases of the program are being carried out almost simultaneously. The well-record files and 7½-minute office work maps receive first treatment, the revisions taking place alphabetically by county. As the sixteen 7½-minute maps which are included in the area previously covered by one of the old base maps are completed, the well locations will be transferred to a 7½-minute topographic quadrangle mylar from which ozalid prints can be run. These mylars are expected to be updated often. When the 16 maps are completed, the 15-minute map will be taken out of print. The revised maps will then be offered as open-file maps. Instructions for ordering will be published in a future issue of *Pennsylvania Geology.* Until that time, paper prints of the 15-minute base maps may be obtained by writing to the State Book Store, P. O. Box 1365, Harrisburg, Pennsylvania 17125. The cost of each base map is $1.40, plus 6 percent sales tax if mailed to a Pennsylvania address. A check for the appropriate total amount, made payable to "Commonwealth of Pennsylvania," must accompany the order. When ordering, please specify the map number.

GEOLOGY OF THE OIL AND GAS FIELDS OF SOUTHWESTERN PENNSYLVANIA

by John A. Harper and Christopher D. Laughrey

Work in progress at the Bureau of Topographic and Geologic Survey, Oil and Gas Geology Division, includes a study of the oil and gas geology of the area south of the Ohio River and west of the Monongahela River in Pennsylvania (Figure 30). This area covers all of Greene and Washington Counties and the southern portions of Allegheny and Beaver Counties.

The study area has some very productive oil fields, including two (McDonald-McCurdy field and Washington-Taylorstown field) considered to be among the 10 major oil fields in Pennsylvania. However, although there have been some "boom" times (in 1892, oil production in southwestern Pennsylvania fields accounted for 49 percent of total state oil production), oil

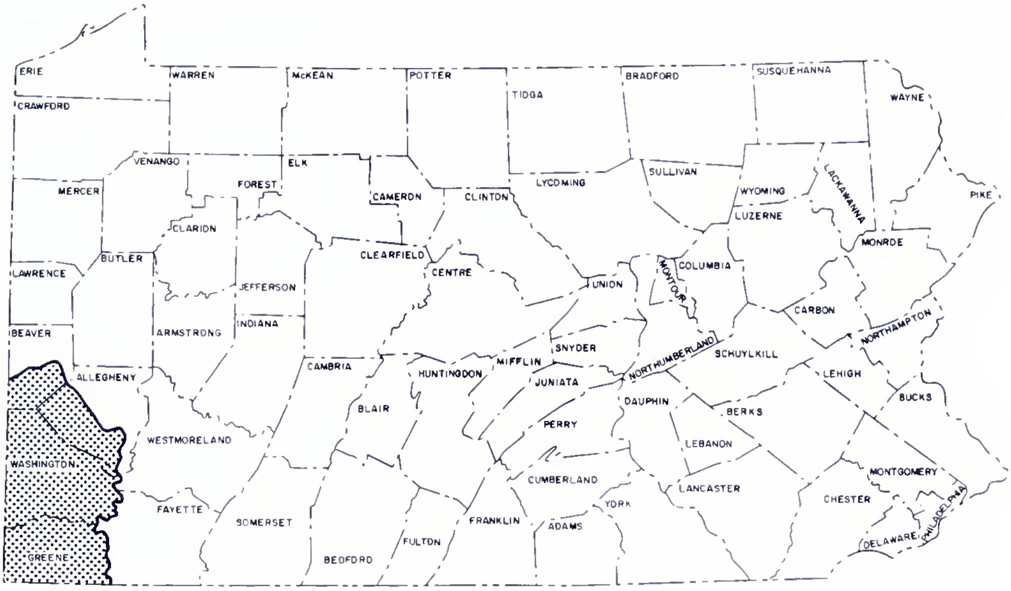

Figure 30. Map showing the location of the study area of the southwestern Pennsylvania project.

production in these fields and in the counties of interest is presently low. The combined productions of Allegheny, Beaver, Greene, and Washington Counties accounted for only about 6 percent of the Commonwealth's total production in 1983. Some fields are essentially abandoned, or close to it. More than half of the fields have never had any enhanced recovery operations on them. Gas well drilling in the area is also low compared to other areas of Pennsylvania. Because there have been great improvements in technology since the early days of the petroleum industry and because prices for crude oil and natural gas have risen dramatically in recent years, the authors believe the fields in southwestern Pennsylvania have great potential for further exploitation.

The study contains detailed discussions of the stratigraphy, structure, reservoir petrology, and depositional environments, historical summaries of the oil and gas fields, and discussions of the types and potential of unconventional sources in the study area. It is hoped that this report will rekindle interest in the oil and gas fields of an area that has been virtually ignored for the last 50 years.

OPEN-FILE REPORTS AND OTHER DATA AVAILABLE

The following reports and other data are available on open file at the Pennsylvania Geological Survey, Oil and Gas Geology Division, 7th Floor, Highland Building, 121 South Highland Avenue, Pittsburgh, Pennsylvania 15206-3988.

(1) *Surface to Middle Devonian (Onondagan) Stratigraphy, Part I (STOMDES),* 1972, by D. R. Kelley and W. R. Wagner, 15 p., 8 cross sections, vertical scale 1 inch = 100 feet.
(2) *Deep Sand Exploration and Gas Developments in Pennsylvania,* 1982, by L. J. Balogh, 2 map sheets, scale 1:250,000 (updated periodically).
(3) *Salina or Equivalent and Deeper Penetrations of Pennsylvania,* 1973, by D. R. Kelley and L. J. Balogh, 1 map, scale 1:500,000 (updated periodically).
(4) *Tully and Deeper Formations, Brine Analysis of Pennsylvania,* 1973, by D. R. Kelley and L. A. Heeren, 1 chart and map, scale 1:500,000.
(5) *Stratigraphic Framework of the Greater Pittsburgh Area, Parts I and II,* 1972, by W. R. Wagner and W. S. Lytle, 20 p., 9 sections in 13 sheets.
(6) *Active Gas Storage Areas Map of Pennsylvania,* 1981, by L. J. Balogh, 1 map, scale 1:500,000 (updated as needed).
(7) *Subsurface Rock Correlation Diagram, Allegheny Plateau, Pennsylvania,* 1979, by J. A. Harper, 1 sheet.

There are also over 40,000 drillers' records and logs, along with approximately 4,500 mechanical logs on open file at the Pennsylvania Geological Survey's Pittsburgh office. Approximately 44,000 well-data cards, compiled by the U.S. Geological Survey and the Pennsylvania Geological Survey between 1900 and 1970 as the bases of topographic-map quadrangle reports, are also on open file. In addition, the Survey has a sample library containing drill cuttings from approximately 1,200 wells, and a core storage library containing cores from 39 wells, including the five wells cored under the U.S. Department of Energy's Eastern Gas Shales Program. All cuttings and cores are available for inspection and study.

SUMMARIZED RECORDS OF REPORTED DEEP WELLS[1] IN 1983

by Christopher D. Laughrey and Cheryl L. Cozart

The information shown in Figure 32 was compiled mainly from drillers' logs, location plats, and geophysical logs received from the Bureau of Oil and Gas Management, as well as personal communication with oil and gas operators. Well records are filed with the Bureau of Oil and Gas Management by permit numbers. The Oil and Gas Geology Division, Bureau of

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[1] Wells that penetrate rocks of Middle Devonian or older age.

Figure 31. Types of mechanical logs and abbreviations.

Caliper	CAL
Casing collar log and perforating record	CCL/PR
Cement bond log (seismic spectrum)	CBL/SS
Compensated neutron	CNL
Continuous dipmeter	DIP
Continuous directional	CDR
Density borehole compensated	DBC
Dual laterolog	DLL
Epthermal neutron porosity	ENP
Formation density	FDC
Gamma ray	GR
High-resolution continuous dipmeter	HDT
Induction log	IL
Laserlog	Laser
Perforating depth control	PDC
Perforating collar log	PCL
Radioactive tracer	Tracer
Radioactive	R
Sibilation	S
Sonic	SON
Sidewall neutron porosity	SNP
Temperature	T

Topographic and Geologic Survey, files the records in order by county, 7½-minute topographic map, and permit number. The Division used to assign a file number separate from the permit number, and these file numbers appear on many of the open-file reports and published maps of the Survey. However, this action was abandoned in January 1982, and all well records are henceforth referred to by permit number.

Most of the formation tops and total depths recorded in Figure 32 were picked from mechanical logs of many varieties (see Figure 31 for lists of these logs and their abbreviations). The logs received for a particular well are listed in Figure 32 along with the logged interval. Lack of this information indicates that no mechanical logs were received and formation picks are taken directly from the drillers' logs. The tables are listed alphabetically by county and numerically by permit number.

Figure 32. Summarized records of reported deep wells in 1983 that penetrated rocks of Middle Devonian or older age.

COUNTY Permit Number	Bedford 20059	Centre 20022	Clearfield 21396	Clearfield 21446	Clinton 20276	Crawford 20658	Crawford 21093	Crawford 21162	Crawford 21175	Crawford 21230
NAME OF WELL	Cletus Mallow #1	PA State Game Lands #1	Commonwealth of PA Tract #324 #1	Helen Shimmel #1	PA State Forest Tract 285 #1	Frenk Trepaeo #1	Hirechmann #1	W. L. Dunn #1	George Lew #3	Vular #1
OPERATOR	Columbia Gas Trans. #20792-T	Atlantic Richfield Company	Adobe Oil & Gas Corporation	Delta Drilling Company	Texaco, U.S.A.	Wainoco Oil & Gas Company #W-40	POI Energy, Incorporated	Cabot Oil & Gas Corporation	G. P. Oil & Gas, Incorporated	POI Energy, Incorporated
TOWNSHIP	Monroe	Rush	Girard	Boggs	Grugan	Steuben	North Shenango	East Fairfield	Beaver	Sparta
QUADRANGLE	Chaneysville	Sandy Ridge	The Knobs	Wallaceton	Glen Union	Centerville	Hartstown	Cochranton	Beaver Center	Spring Creek
LATITUDE	450 ft. S 39°52'30"	5,800 ft. S 40°50'00"	100 ft. S 41°10'00"	3,500 ft. S 40°57'30"	1,350 ft. S 41°22'30"	9,300 ft. S 41°42'30"	6,050 ft. S 41°37'30"	2,250 ft. S 41°32'30"	325 ft. S 41°50'00"	3,150 ft. S 41°47'30"
LONGITUDE	9,050 ft. W 78°22'30"	9,200 ft. W 78°07'30"	4,700 ft. W 78°17'30"	2,200 ft. W 78°17'30"	6,850 ft. W 77°32'30"	2,350 ft. W 79°50'00"	10,500 ft. W 80°25'00"	10,000 ft. W 80°02'30"	1,690 ft. W 80°27'30"	9,050 ft. W 79°35'00"
DATE COMPLETED	11-1-82	6-30-83	1-13-83	9-27-82	8-12-82	12-22-79	2-8-81	10-23-81	10-29-81	9-11-81
ELEVATION	1520 GR	2378 GR	1921 GR	1800 GR	2004 GR	1585 GR	1066 GR	1130 GR	975 GR	1685 GR
LOGS RECEIVED AND LOGGED INTERVALS	CNL/GR: 100-6481 OI/GR: 988-6481 SON: 988-6468 OIP: 988-6481	CNL/Litho: 132-9551 OLL/GR: 2446-9539 SNL: 132-2454 Audio: 120-2454	FOC/IL: 3100-7358 GR/CNL: 3120-7358 T: 3000-7358		OBC/SON: 200-19359 GR/CNL: 9992-14945 CNL/Litho: 19460-19359 OLL: 1700-19359	GR/IL: 410-5320		OR/T/CCL: 0-3571		GR/OBC/SNL: 340-5298 Son: 351-5280 VOL/Laser: 5000-5210
TULLY		7064-7122	6378-	6950-	7150-	3468-		3124-		3502-
ONONDAGA LIMESTONE CHERT	6182-	8060- -8104	7171-		8190-	3694-		3329-	2120-	3762-
ORISKANY	6304-	8104-8124	7211-	7960-	8232-	Absent		3505-		Absent
HELDERBERG KEYSER-BASS ISLANDS		8124-8512	7220-		8380- Tonoloway - 8586	3858- 3894-	2562-	3530-		3912- 3932-
SALINA GUELPH-LOCKPORT		Tonoloway Ls Transition 8512-9500			Wills Creek - 9542 Bloomsburg - 9950	3942- 4609-	3070- 3576-			3982- 4620-
CLINTON IRONDEQUOIT		Wills Creek 9500- Bloomsburg 9947-?			Mifflintown 10044- Rose Hill 10492- Tuscarora 10990-	4891- 4951-	3814- 3948-			4912- 4971-
MEDINA GRIMSBY WHIRLPOOL		McKenzie Mbr of the Mifflintown Fm 9970- Rochester Sh 10322-			Bald Eagle - 12246 Reedsville - 13462 Antes - 14060	5018- 5051- 5166-	3968- 4144-		3327-	5020- 5058- 5182-
QUEENSTON		Keefer 10394- Rose Hill 10438-			14285-	5187-	4154-		3345-	5194-
PRODUCING FORMATION	Oriskany	Dry	Oriskany	Oriskany	Bald Eagle	Medina	Medina		Medina	Medina
PRODUCING INTERVAL	6336-6453		7212-7218	7967-7972	13,030-12,900	5054-5180	4046-4054	3508-3571	3372-3503	5059-5193
TOTAL DEPTH	6495	13,848	7358	8001	19,365	5325	4300	3592	3585	5300
DEEPEST FORMATION REACHED	Helderberg	Reedsville? 13672-	Helderberg	Oriskany	Pleasant Hill	Queenston	Queenston	Helderberg	Queenston	Queenston
RESULTS	310 Mcf AF 1,897 psi/72 hrs. New pool discovery Weimer Run pool Five Forks field	Tuscarora 10924- Tuscarora/Juniata Transition: 11317- Juniata 11385- Bald Eagle 12730- Reedsville? 13672- Sandy Ridge	1,100 Mcf Nat. 5,729 Mcf AF 3,550 psi/312 hrs. New field discovery Gifford Run field	130 Mcf AF 1,850 psi/72 hrs. extension West Decatur field	3,847 Mcf AF Beekmantown - 15286 Gatesburg - 17338 Warrior - 18750 Pleasant Hill - 19036 New field discovery Grugan field	116 Mcf AF 1,330 psi/240 hrs. New pool discovery Steuben pool Athens	40 Mcf AF 1,280 psi/30 days New pool discovery Espyville pool South Shenango	Disposal well Kantz Corners field	750 Mcf AF 1,250 psi/48 hrs. development Mud Run pool Conneaut	200 Mcf AF 1,225 psi/48 hrs. development County Line field

COUNTY Permit Number	Crawford 21346	Crawford 21369	Crawford 21415	Crawford 21442	Crawford 21443	Crawford 21447	Crawford 21450	Crawford 21523	Crawford 21524	Crawford 21538
NAME OF WELL	J. & A. Sabol #1	Sandor #1	E. Morton #1	Deibel Partnership #1	Deibel Partnership #2	Marsun #2	Robert Hare #1	Zinchiak #1	Plementosh #1	David Linz Unit #2
OPERATOR	Mitchell Energy Corporation	POI Energy, Incorporated	Meridian Exploration #599	Meridian Exploration #596	Meridian Exploration #597	POI Energy, Incorporated	Center Bar Company	Ingram Enterprises Incorporated	Ingram Enterprises Incorporated	Ingram Enterprises Incorporated
TOWNSHIP	Summerhill	Rome	Rockdale	Rockdale	Rockdale	Rome	Beaver	Hayfield	Hayfield	Spring
QUADRANGLE	Harmonsburg	Spartansburg	Miller's Station	Miller's Station	Miller's Station	Spring Creek	Beaver Center	Meadville	Meadville	Conneautville
LATITUDE	5,000 ft. S 41°42'30"	9,250 ft. S 41°47'30"	2,100 ft. S 41°47'30"	4,150 ft. S 41°47'30"	5,950 ft. S 41°47'30"	9,300 ft. S 41°47'30"	13,600 ft. S 41°52'30"	6,200 ft. S 41°42'30"	9,000 ft. S 41°42'30"	12,500 ft. S 41°52'30"
LONGITUDE	9,500 ft. W 80°15'00"	150 ft. W 79°37'30"	9,450 ft. W 79°55'00"	1,550 ft. W 79°55'00"	2,700 ft. W 79°55'00"	9,800 ft. W 79°35'00"	2,175 ft. W 80°25'00"	3,800 ft. W 80°10'00"	9,500 ft. W 80°10'00"	90 ft. W 80°17'30"
DATE COMPLETED	10-9-81	9-23-81	11-24-81	11-8-81	12-4-81	10-16-81	9-1-82	1-21-82	1-11-82	3-9-82
ELEVATION	1340 GR	1678 GR	1205 GR	1525 GR	1395 GR	1698 GR	968 GR	1392 GR	1205 GR	1150 GR
LOGS RECEIVED AND LOGGED INTERVALS	DBC/CNL/GR: 320-4477	GR/OBC/SNL:41-5352 Son: 532-5352 Laser: 5126-5250	GR/DBC: 450-4379 T: 400-4386 DLL: 3150-4356	GR/DBC: 0-4765 DLL: 4606-4753 CBL: 3800-4690	GR/DBC: 446-4647 INO: 2646-4640 CBL: 3600-4560 T: 4198-4653	DLL: 276-5358 OBC/GR: 21-5362 VDL: 293-5364		IL: 2790-4570 OBC/GR: 250-4564 CNL: 250-4579	DBC/GR/CNL: 2600-4348	GR: 2100-3816 CNL: 2100-3831 OBC: 2100-3826 OLL: 2100-3825
TULLY	2718-	3558-	2648-	3026-	2896-	3552-	1964-	2828-	2620-	2136-
ONONDAGA LIMESTONE CHERT	2887-	3820-	2868-	3248-	3119-	3814-	2132-	3014-	2800-	2332-
ORISKANY	3084-	3968-	3050-	3428-	Absent	Absent		Absent	2996-	2588-
HELDERBERG KEYSER-BASS ISLANDS	3094- 3118-	3982- 3986-	3074-	3451- 3470-	3296- 3322-	3958- 3976-	2330-	3204- 3238-	3008- 3038-	2602- 2620-
SALINA GUELPH-LOCKPORT	3160- 3820-	4032- 4670-	3116- 3733-	3486- 4108-	3356- 3984-	4024- 4636-	2468- 2988-	3286- 3938-	3082- 3744-	2669- 3212-
CLINTON IRONDEQUOIT	4126- 4180-	4964- 5026-	4004- 4062-	4382- 4440-	4256- 4314-	4947- 5012-	3264-	4240- 4292-	4024- 4090-	3514- 3558-
MEDINA GRIMSBY WHIRLPOOL	4226- 4268- 4396-	5066- 5115- 5240-	4102- 4136- 4268-	4480- 4516- 4646-	4355- 4392- 4524-	5060- 5098- 5225-	3362-	4342- 4372- 4508-	4156- 4164- 4306-	3614- 3634- 3766-
QUEENSTON	4406-	5252-	4284-	4662-	4548-	5236-	3548-	4522-	4318-	3774-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4225-4402	5126-5250	4144-4213	4532-4654	4397-4463	5100-5228	3595-3482	4375-4516	4162-4312	3617-3772
TOTAL DEPTH	4477	5352	4386	4767	4653	5364	3595	4564	4364	3832
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	265 Mcf AF 1,220 psi/312 hrs. development Indian Springs pool Conneaut field	225 Mcf AF 1,250 psi/48 hrs. development Hatchtown pool Church Run field	98 Mcf AF 1,120 psi/168 hrs. extension Brown Hill pool Eaton Corners field	395 Mcf AF 1,275 psi/168 hrs. development Brown Hill pool Eaton Corners field	515 Mcf AF 1,310 psi/168 hrs. development Brown Hill pool Eaton Corners field	150 Mcf AF 1,325 psi/168 hrs. extension Hatchtown pool Church Run field	IP not given development Stone Run pool Conneaut field	2,300 Mcf AF 1,200 psi/72 hrs. development Kastle pool Conneaut field	1,900 Mcf AF 1,000 psi/72 hrs. development Kastle pool Conneaut field	1,200 Mcf AF 1,090 psi/72 hrs development Indian Springs pool Conneaut field

Figure 32. *(Continued)*

COUNTY Permit Number	Crawford 21574	Crawford 21577	Crawford 21578	Crawford 21580	Crawford 21589	Crawford 21590	Crawford 21641	Crawford 21642	Crawford 21647	Crawford 21661
NAME OF WELL	Donald Henton #1	Thomas J. Rogers #1	George Brown #1	L. Sterling #1	Max Ferris #1	C. Shearer #1	Daryl Brown #1	Milford Ferris #1	John Hoogstad #2	Michael W. Medved #1
OPERATOR	N.Y.S. Natural Gas Company	Atlas Resources, Incorporated	Meridian Exploration #617	Meridian Exploration #615	Meridian Exploration #614	Meridian Exploration #616	Meridian Exploration #622	Meridian Exploration #620	Center Bar Company #33	Northwest Natural Gas Company
TOWNSHIP	Rome	Spring	Rockdale	Rockdale	Rockdale	Rockdale	Rockdale	Rockdale	Spring	Spring
QUADRANGLE	Titusville North	Conneautville	Miller's Station	Miller's Station	Miller's Station	Miller's Station	Miller's Station	Miller's Station	Conneautville	Beaver Center
LATITUDE	4,650 ft. S 41°45'00"	1,300 ft. S 41°50'00"	13,700 ft. S 41°50'00"	11,150 ft. S 41°50'00"	13,100 ft. S 41°50'00"	11,800 ft. S 41°50'00"	15,150 ft. S 41°50'00"	14,300 ft. S 41°50'00"	8,200 ft. S 41°50'00"	11,250 ft. S 41°52'30"
LONGITUDE	600 ft. W 79°42'30"	1,150 ft. W 80°17'30"	8,100 ft. W 79°55'00"	7,200 ft. W 79°55'00"	10,600 ft. W 79°55'00"	4,100 ft. W 79°55'00"	6,050 ft. W 79°55'00"	700 ft. W 79°57'30"	4,100 ft. W 80°20'00"	1,250 ft. W 80°22'30"
DATE COMPLETED	5-20-82	4-8-82	5-17-82	5-24-82	6-5-82	5-6-82	6-30-82	6-12-82	8-25-82	5-26-82
ELEVATION	1442 GR	1180 GR	1340 GR	1410 GR	1305 GR	1495 GR	1395 GR	1195 GR	1165 GR	1040 GR
LOGS RECEIVED AND LOGGED INTERVALS	OBC/CNL/GR: 0-5210	GR: 2500-3891	GR/DBC: 0-4490 DLL: 4280-4575	GR/OBC: 0-4472	GR/OBC: 0-4418 OLL: 2402-4402	GR/OBC: 0-4624	GR/OBC: 2500-4564 DLL: 2500-4550	GR/OBC: 2300-4352 OLL: 2300-4352	GR: 100-3874 OBC: 100-3884 IL: 100-3883	
TULLY	3342-	2350-	2774-	2825-	2715-	2921-	2836-	2602-	2236-	1990-
ONONDAGA LIMESTONE CHERT	3584-	2431-	2996-	3042-	2936-	3143-	3057-	2822-	2412-	2158-
ORISKANY		2652-		Absent	Absent	Absent	Absent	Absent	Absent	
HELDERBERG KEYSER-BASS ISLANDS	3772-	2674- 2724-	3176- 3194-	3225- 3244-	3121- 3132-	3326- 3344-	3238- 3262-	3006- 3024-	2632- 2659-	2352-
SALINA GUELPH-LOCKPORT	3860- 4452-	2818- 3317-	3244- 3852-	3288- 3900-	3182 3779-	3386 3996-	3304- 3911-	3178 3692-	2700- 3282-	3030-
CLINTON IRONDEQUOIT	4730- 4792-	3556- 3628-	4122- 4182-	4172- 4230-	4070- 4128-	4265- 4326-	4188- 4246-	3964- 4023-	3548- 3615-	3307-
MEDINA GRIMSBY WHIRLPOOL	4842- 4884- 5001-	3664- 3832-	4222- 4248- 4388-	4268- 4306- 4438-	4169- 4196- 4331-	4368- 4421- 4533-	4286- 4320- 4450-	4066- 4098- 4226-	3652- 3670- 3822-	3400-
QUEENSTON	5022-	3842-	4402-	4450-	4344-	4543-	4466-	4240-	3830-	
PRODUCING FORMATION	Medina	Oriskany	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medine
PRODUCING INTERVAL	4852-4946	2648-2650	4259-4319	4308-4364	4204-4256	4401-4476	4344-4404	4100-4237	3696-3788	3449-3476
TOTAL DEPTH	5212	3930	4500	4475	4421	4627	4566	4354	3890	3630
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	690 Mcf AF 1,275 psi/72 hrs. development Rome pool Athens field	2,200 Mcf Nat. 820 psi/72 hrs. New pool discovery Rogers pool Conneaut field	350 Mcf AF 1,100 psi/336 hrs. extension Rockdale field	92 Mcf AF 1,090 psi/168 hrs. development Rockdale field	221 Mcf AF 1,020 psi/24 hrs. development Rockdale field	108 Mcf AF 1,200 psi/168 hrs. development Rockdele field	80 Mcf Nat. 340 Mcf AF 1,300 psi/168 hrs. development Rockdale field	213 Mcf AF 1,280 psi/168 hrs. development Rockdale field	756 Mcf AF 1,050 psi/48 hrs. development Lundys Lane pool Conneaut field	1,100 Mcf AF 1,050 psi/48 hrs. development Lundys Lane pool Conneaut field

COUNTY Permit Number	Crawford 21676	Crawford 21706	Crawford 21717	Crawford 21718	Crawford 21732	Crawford 21733	Crawford 21767	Crawford 21793	Crawford 21797	Crawford 21813
NAME OF WELL	John Wallach Unit #1	Donald Banton #2	J. Wilkins #1	G. Brown #1	Mary Bunting Unit #1	M. Bunting #1	William E. Sutter #1	Charles & Barbara Wilson #1	J. & K. Randulic #1	Leon Burdick #1
OPERATOR	Meridian Exploration #621	N.Y.S. Natural Gas Company	Meridian Exploration #623	Meridian Exploration #619	Meridian Exploration #633	Meridian Exploration #630	Meridian Exploration #618	Northwest Natural Gas Company	Mitchell Energy Corporation	Meridian Exploration #629
TOWNSHIP	Rockdale	Rome	Rockdale	Rockdale	Rockdale	Rockdale	Rockdale	Spring	Sedsbury	Rockdale
QUADRANGLE	Miller's Station	Titusville North	Miller's Station	Miller's Station	Miller's Station	Miller's Station	Miller's Station	Conneautville	Conneaut Lake	Miller's Station
LATITUDE	700 ft. S 41°50'00"	4,650 ft. S 41°45'00"	10,600 ft. S 41°50'00"	8,250 ft. S 41°50'00"	850 ft. S 41°47'30"	5,200 ft. S 41°47'30"	2,500 ft. S 41°47'30"	9,550 ft. S 41°52'30"	1,400 ft. S 41°37'30"	7,500 ft. S 41°47'30"
LONGITUDE	8,200 ft. W 79°55'00"	10,050 ft. W 79°40'00"	5,550 ft. W 79°55'00"	4,200 ft. W 79°55'00"	3,150 ft. W 79°55'00"	150 ft. W 79°55'00"	1,900 ft. W 79°55'00"	2,300 ft. W 80°20'00"	9,000 ft. W 80°20'00"	4,000 ft. W 79°55'00"
DATE COMPLETED	6-22-82	6-12-82	6-15-82	6-11-82	8-2-82	7-25-82	6-4-82	7-21-82	9-15-82	8-12-82
ELEVATION	1310 GR	1465 GR	1470 GR	1450 GR	1515 GR	1585 GR	1555 GR	1130 GR	1169 GR	1220 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC: 380-4468 DLL: 2383-4458	GR/DBC/CNL:0-5194			GR/DBC: 0-4714 DLL: 2600-4715	GR/DBC: 2805-4835 DLL: 84-4831 GR/CCL: 4450-4787	GR: 0-4660 PCL: 4660-4768 DLL: 4230-4652		GR/DBC: 2385-4394 DLL: 2389-4392	GR/DBC: 160-4476 DLL: 343-4477
TULLY	2748-	3378-	2872-	2800-	2980-	3088-	3089-	2092-	2610-	2731-
ONONDAGA LIMESTONE CHERT	2968-	3623-	3094-	3070-	3204-	3314-	3264-	2270-	2767-	2952-
ORISKANY	Absent				Absent	Absent	Absent		2964-	.3129-
HELDERBERG KEYSER-BASS ISLANDS	3150- 3172-	3800-	3275-	3253-	3386- 3402-	3494- 3522-	3446- 3464-	2484-	2975- 2984-	3146- 3158-
SALINA GUELPH-LOCKPORT	3216 3822-	3844- 4480-	3634- 3950-	3624- 3928-	3452 4058-	3554- 4176-	3506- 4100-	3138-	3062- 3748-	3186- 3820-
CLINTON IRONDEQUOIT	4116- 4164-	4762- 4826-	4278-	4255-	4334- 4392-	4450- 4508-	4394- 4449-	3410-	4040- 4093-	4090-
MEDINA GRIMSBY WHIRLPOOL	4208- 4236- 4367-	4876- 4922- 5038-	4372- 4480-	4350- 4457-	4432- 4471- 4596-	4550- 4588- 4716-	4496- 4520- 4656-	3503-	4138- 4172- 4315-	4188- 4226- 4356-
QUEENSTON	4382-	5056-	4492-	4472-	4613-	4733-	4670-		4326-	4372-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4240-4312	4927-5052	4376-4417	4351-4391	4472-4538	4592-4660	4537-4600	3555-3595	4149-4323	4230-4314
TOTAL DEPTH	4469	5194	4587	4596	4716	4837	4768	3750	4395	4478
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	92 Mcf AF 1,100 psi/168 hrs. development Brown Hill pool Eaton Corners field	850 Mcf AF 1,275 psi/48 hrs. development Rome pool Athens field	112 Mcf AF 1,200 psi/168 hrs. development Rockdale field	91 Mcf Nat. 431 Mcf AF 1,190 psi/168 hrs. development Rockdale field	117 Mcf AF 1,170 psi/168 hrs. development Brown Hill pool Eaton Corners field	410 Mcf AF 1,302 psi/168 hrs. development Brown Hill pool Eaton Corners field	75 Mcf AF 1,150 psi/168 hrs. development Brown Hill pool Eaton Corners field	1,200 Mcf AF 1,030 psi/48 hrs. development Lundys Lane pool Conneaut field	20 Mcf AF 1,075 psi/312 hrs. extension Conneaut Lake field	319 Mcf AF 1,140 psi/168 hrs. development Brown Hill pool Eaton Corners field

Figure 32. *(Continued)*

COUNTY Permit Number	Crawford 21819	Crawford 21820	Crawford 21821	Crawford 21838	Crawford 21839	Crawford 21840	Crawford 21841	Crawford 21851	Crawford 21856	Crawford 21857
NAME OF WELL	H. Adams #1	William Joslin #1	Herman Szymanski #1	Harry Boylen #1	R. Willis #1	R. Willie #2	Reid Willis #3	R. Willis #4	Edward & Arlo Potter #2	L. Batyko #1
OPERATOR	Meridian Exploration #650	Meridien Exploration #651	Meridian Exploration #649	Meridien Exploration #645	Meridien Exploration #641	Meridien Exploration #646	Maridien Exploration #647	Meridien Exploration #638	Northwest Natural Gas Company	Mitchell Energy Corporation
TOWNSHIP	Rockdale	Rockdale	Rockdale	Cambridge Springs	Rockdale	Rockdale	Rockdale	Rockdale	Spring	Summerhill
QUADRANGLE	Miller's Station	Miller's Station	Miller's Station	Cambridge Springs	Miller's Station	Miller's Station	Miller's Station	Miller's Station	Beaver Center	Harmonsburg
LATITUDE	8,600 ft. S 41°50'00"	9,600 ft. S 41°50'00"	5,550 ft. S 41°50'00"	5,400 ft. S 41°47'30"	5,200 ft. S 41°47'30"	3,800 ft. S 41°47'30"	3,800 ft. S 41°47'30"	5,350 ft. S 41°47'30"	10,400 ft. S 41°52'30"	2,250 ft. S 41°42'30"
LONGITUDE	7,450 ft. W 79°55'00"	9,800 ft. W 79°55'00"	1,700 ft. W 79°57'30"	9,550 ft. W 80°02'30"	6,300 ft. W 79°55'00"	5,500 ft. W 79°55'00"	7,300 ft. W 79°55'00"	4,500 ft. W 79°55'00"	550 ft. W 80°20'30"	8,150 ft. W 80°17'30"
DATE COMPLETED	9-26-82	9-19-82	9-10-82	10-7-82	10-9-82	10-27-82	11-3-82	10-18-82	7-23-82	10-7-82
ELEVATION	1420 GR	1360 GR	1290 GR	1420 GR	12'5 GR	1350 GR	1260 GR	1310 GR	1050 GR	1300 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/OBC: 2487-4512 OLL: 2500-4504	GR/OBC: 2400-4467	GR/DLL: 2295-4379 DBC: 21-4382	GR/OBC: 2500-4508 OLL: 2496-4509	GR/OBC: 2400-4419 GO: 2400-4420	GR/OBC: 2548-4552 GD: 14-4545	GR/DBC: 2400-4452 LL: 16-4446	GR/DBC: 2550-4558 OLL: 2550-4559		GR/CNL: 2300-4364
TULLY	2804-	2748-	2658-	2758-	2710-	2823-	2722-	2822-	2010-	2629-
ONONDAGA LIMESTONE CHERT	3026-	2966-	2876-	2964-	2930-	3045-	2944-	3044-	2188-	2794-
ORISKANY	Absent	Absent	Absent	Absent	Absent	Absent	Absant	Absent		Absant
HELDERBERG KEYSER-BASS ISLANDS	3206- 3226-	3150- 3170-	3064- 3082-	3156- 3182-	3110- 3126-	3226- 3244-	3126- 3146-	3224- 3240-	2380-	2992- 3026-
SALINA GUELPH-LOCKPORT	3270- 3878-	3216- 3832-	3132- 3720-	3228- 3890-	3168 3788-	3288 3902-	3186- 3804-	3282 3904-	3040-	3070- 3774-
CLINTON IRONDEQUOIT	4152- 4209-	4098- 4156-	4007- 4064-	4144- 4200-	4066- 4124-	4172- 4228-	4073- 4130-	4174- 4232-	3312-	4042- 4096-
MEDINA GRIMSBY WHIRLPOOL	4248- 4292- 4412-	4200- 4236- 4361-	4100- 4139- 4265-	4238- 4266- 4408-	4164- 4208- 4332-	4267- 4270- 4438-	4172- 4202- 4336-	4272- 4312- 4441-	3406-	4138- 4164- 4310-
QUEENSTON	4426-	4372-	4280-	4420-	4348-	4454-	4352-	4456-		4324-
PRODUCING FORMATION	Madina	Medine	Medina	Medine	Medina	Madina	Medine	Medina	Medina	Medine
PRODUCING INTERVAL	4307-4420	4237-4368	4142-4174	4277-4415	4210-4268	4304-4398	4214-4295	4328-4398	3449-3531	4146-4321
TOTAL DEPTH	4514	4467	4382	4510	4421	4554	4460	4560	3660	4375
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queanston	Queenston	Queenston	Queenston	Queenston	Quaanston
RESULTS	33 Mcf Nat. 252 Mcf AF 1,120 psi/236 hrs. development Rockdela field	60 Mof Nat. 402 Mcf AF 1,150 psi/168 hrs development Rockdale field	319 Mof AF 1,140 psi/24 hrs. development Rockdale field	70 Mcf AF 1,180 pei/168 hrs. development Cambridge pool Cambridge Springs field	372 Mcf AF 1,225 psi/168 hre. development Brown Hill pool Eeton Corners field	130 Mof AF 1,205 pei/168 hrs. development Brown Hill pool Eaton Corners field	75 Mof AF 1,225 psi/168 hrs. developmant Brown Hill pool Eaton Corners field	962 Mof AF 1,240 psi/168 hrs. development Brown Hill pool Eaton Cornere field	1,100 Mof AF 1,000 psi/48 hrs. development Lundys Lane pool Conneaut field	444 Mof AF 1,200 psi/168 hrs. development Indien Springs pool Conneaut field

COUNTY Permit Number	Crawford 21858	Crawford 21863	Crawford 21882	Crawford 21889	Crawford 21907	Crawford 21921	Crawford 21928	Crawford 21932	Crawford 21953	Crawford 21954
NAME OF WELL	Walter Bayus #2	Mosaa-Sabella #2	A. L. Lauderbaugh #1	Ivan Vincent #1	John Kort #3	Milton Quiring Unit #1	L. & V. Sousa #1	Roy G. & Martha L. Bartges #1	Tautin #1	R. Gonser #1
OPERATOR	Cardinal Oil Company #68	Cardinal Oil Company #67	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cardinal Oil Company #51	Meridian Exploration #664	Mitchell Energy Corporation	Mitchell Energy Corporation	Ingram Enterprises Incorporated	Meridian Exploration #695
TOWNSHIP	Cussewago	Cussewago	Fairfield	Cochranton	Cussewago	Rockdale	Sadsbury	Sadsbury	Hayfield	Rockdale
QUADRANGLE	Conneautville	Conneautville	Geneva	Cochranton	Conneautville	Miller's Station	Conneaut Lake	Linesville	Meadville	Miller's Station
LATITUDE	14,640 ft. S 41°52'30"	13,400 ft. S 41°52'30"	11,000 ft. S 41°32'30"	6,250 ft. S 41°32'30"	4,740 ft. S 41°50'00"	7,700 ft. S 41°50'00"	10 ft. S 41°37'30"	12,250 ft. S 40°40'00"	8,500 ft. S 41°42'30"	6,500 ft. S 41°47'30"
LONGITUDE	2,320 ft. W 80°15'00"	4,440 ft. W 80°15'00"	1,400 ft. W 80°07'30"	1,100 ft. W 80°02'30"	2,200 ft. W 80°15'00"	4,800 ft. W 79°57'30"	7,550 ft. W 80°15'00"	3,650 ft. W 80°22'30"	6,500 ft. W 80°10'00"	9,950 ft. W 79°52'30"
DATE COMPLETED	11-15-82	11-25-82	12-5-82	11-21-82	11-22-82	12-17-82	1-24-83	3-10-83	4-23-83	5-10-83
ELEVATION	1127 GR	1145 GR	1300 GR	1070 GR	1247 GR	1205 GR	1245 GR	1069 GR	1232 GR	1560 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/CNL: 2150-3880 PCL: 3550-3865	FOC/GR: 2150-3868 GR/FCL: 3500-3854	GR/DBC: 571-5155 GR/GD: 571-5153	GR/OBC: 0-4994 GR/GO: 526-4992	GR/FDC: 2250-3900 GO: 2250-3950	GR/DBC: 1997-4258 GR/OLL: 30-4258	GR/OBC: 2400-4529 OLL: 2400-4518	GR/OBC: 406-4250 LL: 406-4244 T: 406-4236		GR/OBC: 2823-4826 OLL: 428-4801
TULLY	2184-	2180-	3312-	3134-	2300-	2544-	2746-	2474-	2680-	3072-
ONONDAGA LIMESTONE CHERT	2376-	2378-	3496-	3344-	2487-	2762-	2906-	2631-	2866-	3296-
ORISKANY	Absent	Absent	3668-	3510-	2696-	Absent	3102-	Absent	3142-	Absent
HELDERBERG KEYSER-BASS ISLANDS	2574- 2606-	2596- 2640-	3688- 3696-	3532- 3538-	2700- 2724-	2942- 2964-	3108- 3136-	2830- 2848-	3191-	3474- 3488-
SALINA GUELPH-LOCKPORT	2668- 3230-	2706- 3264-	3778 4532-	3634 4368-	2768- 3400-	3006- 3608-	3194 3912-	2922- 3616-	3342 3756-	3534- 4096-
CLINTON IRONDEQUOIT	3510- 3562-	3532- 3586-	4798- 4860-	4646- 4706-	3630- 3700-	3896- 3953-	4178- 4232-	3908- 3960-	4082-	4440- 4497-
MEDINA GRIMSBY WHIRLPOOL	3632- 3656- 3768-	3636- 3642- 3786-	4914- 4953- 5098-	4762- 4802- 4944-	3744- 3758- 3906-	3994- 4018- 4156-	4278- 4322- 4454-	4008- 4026- 4180-	4190-	4547- 4574- 4706-
QUEENSTON	3784-	3795-	5115-	4956-	3916-	4168-	4466-	4194-	4380-	4726-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3644-3723	3656-3799	4955-5068	4769-4902	3782-3842	4042-4095	4290-4464	4009-4189	4226-4372	4603-4644
TOTAL DEPTH	3895	3863	5159	4996	4006	4258	4533	4280	4488	4828
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	840 Mcf AF 875 psi/48 hrs. development Indian Springs pool Conneaut field	930 Mcf AF 1,025 psi/48 hrs. development Indian Springs pool Conneaut field	1,600 Mcf AF 1,400 psi/72 hrs. development Kantz Corners field	5,000 Mcf AF 1,450 psi/72 hrs. development Round Knob pool Kantz Corners field	2,306 Mcf AF 1,000 psi/48 hrs. development Indian Springs pool Conneaut field	80 Mcf Nat. 422 Mcf AF 1,000 psi/24 hrs. development Rockdale field	508 Mcf AF 1,210 psi/115 hrs. extension Conneaut Lake field	510 Mcf AF 1,185 psi/138 hrs. extension Conneaut Lake field	1,100 Mcf AF 950 psi/72 hrs. development Kastle pool Conneaut field	37 Mcf Nat. 262 Mcf AF 1,200 psi/168 hrs. development Brown Hill pool Eaton Corners field

Figure 32. *(Continued)*

COUNTY Permit Number	Crawford 21957	Crawford 21958	Crawford 21962	Crawford 21964	Crawford 21965	Crawford 21966	Crawford 21989	Elk 20755	Erie 21097	Erie 21098
NAME OF WELL	Florien Florek #3	Ray Andrus #1	McClellan #1	McQueen Estate #1	Vincent Byrne #1	Sylvie Wilcox #1	Jake D. Byler #1	Henley-Bird #9110	R. Dale #1	G. Gruenwald #1
OPERATOR	Meridian Exploration #693	Meridian Exploration #686	Meridian Exploration #694	Meridian Exploration #697	Meridian Exploration #689	Meridian Exploration #700	Wainoco Oil & Gas Co. #W-217A	Penn-Cal Contractors, Inc.	Envirogas, Incorporated	Envirogas, Incorporated
TOWNSHIP	Venango	Rockdale	Rockdale	Rockdale	Rockdale	Rockdale	Sparta	Highland	Greenfield	Greenfield
QUADRANGLE	Edinboro South	Cambridge Springs	Miller's Station	Miller's Station	Miller's Station	Cambridge Springs	Spartansburg	James City	North East	North East
LATITUDE	9,550 ft. S 41°52'30"	9,700 ft. S 41°50'00"	7,100 ft. S 41°50'30"	6,350 ft. S 41°50'30"	7,600 ft. S 41°50'00"	9,550 ft. S 41°50'00"	3,700 ft. S 41°47'30"	13,650 ft. S 41°35'00"	5,360 ft. S 42°10'00"	6,377 ft. S 42°10'00"
LONGITUDE	2,700 ft. W 80°07'30"	1,800 ft. W 80°00'00"	7,050 ft. W 79°57'30"	4,200 ft. W 79°55'00"	6,000 ft. W 79°55'00"	3,700 ft. W 80°00'00"	11,300 ft. W 79°40'00"	11,100 ft. W 78°50'00"	750 ft. W 79°47'30"	9,850 ft. W 79°47'00"
DATE COMPLETED	6-13-83	5-16-83	5-24-83	6-27-83	6-8-83	6-15-83	7-24-83	9-20-81	8-25-80	8-12-80
ELEVATION	1330 GR	1135 GR	1160 GR	1510 GR	1400 GR	1140 GR	1360 GR	1870 GR	1460 GR	1440 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR: 2628-4159	GR/DBC: 2199-4218 LL: 573-4216	GR/DBC: 2200-4242 DLL: 2231-4230	GR/DBC: 412-4628 DLL: 2592-4628	GR/DBC: 275-4503 DLL: 2362-4502	GR/DBC: 2220-4222 DLL: 2222-4219	GR/DBC: 0-4894 DLL: 500-4888			
TULLY		2492-	2512-	2910-	2799-	2478-	3082-	4800-	2075-	2056-
ONONDAGA LIMESTONE CHERT	2661-	2708-	2732-	3134-	3025-	2693-	3322-		2324-	2294-
ORISKANY	Absent	Absent	Absent	Absent	Absent	2878-	Absent			
HELDERBERG KEYSER-BASS ISLANDS	2912-	2898- 2912-	2920- 2942-	3312- 3336-	3208- 3229-	2890- 2901-	3530-		2561-	2550-
SALINA GUELPH-LOCKPORT	3010- 3584-	2962- 3586-	2986- 3590-	3376- 4006-	3270- 3884-	2948- 3592-	3572- 4172-		2690- 3042-	2666- 3024-
CLINTON IRONDEQUOIT	3846- 3898-	3848- 3902-	3862- 3918-	4262- 4320-	4122- 4204-	3840- 3896-	4397- 4522-		3322- 3363-	3298- 3340-
MEDINA GRIMSBY WHIRLPOOL	3972- 4106-	3943- 3964- 4106-	3956- 3984- 4120-	4357- 4406- 4520-	4244- 4282- 4408-	3936- 3964- 4099-	4569- 4731-		3380- 3396- 3535-	3357- 3422- 3510-
QUEENSTON	4113-	4120-	4134-	4536-	4424-	4113-	4744-		3550-	3526-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Bradford		
PRODUCING INTERVAL	3966-4023	3993-4065	3987-4076	4408-4460	4284-4350	3972-4107	4609-4743	2375-2800		
TOTAL DEPTH	4195	4220	4235	4636	4505	4224	4905	5004	3618	3622
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Marcellus	Queenston	Queenston
RESULTS	63 Mcf Nat. 549 Mcf AF 1,275 psi/168 hrs. development Cambridge Springs field	220 Mcf AF 1,275 psi/192 hrs. development Rockdale field	115 Mcf Nat. 297 Mcf AF 1,180 psi/168 hrs. development Rockdale field	320 Mcf AF 1,225 psi/312 hrs. development Rockdale field	23 Mcf Nat. 126 Mcf AF 1,250 psi/168 hrs. development Rockdale field	130 Mcf AF 1,225 psi/168 hrs. development Rockdale field	257 Mcf AF 1,290 psi/72 hrs. extension Rome pool Athens field	Dry deeper pool test 70 Mcf Nat. in shallow zones 430 psi/48 hrs. Kane field	Dry and abandoned development Bull Reservoir pool North East field	Dry and abandoned development Bull Reservoir pool North East field

COUNTY Permit Number	Erie 21239	Erie 21259	Erie 21349	Erie 21431	Erie 21437	Erie 21509	Erie 21527	Erie 21655	Erie 21717	Erie 21806
NAME OF WELL	Walter Kosienski #4	Erie Technical Memorial School #1	Pier #1	McCall #1	I. Lewis #2	Robert Beck #1	Charles W. & David Guriel #1	J. Hall #1	Zimmerly #1	Gordon Post #1
OPERATOR	Mutual Oil & Gas Co. #M-23-P	Moody and Associates, Inc.	Vineyard Oil & Gas Company	Robert Brace	Envirogas, Incorporated	Vineyard Oil & Gas Company	N.E.A. Cross Company	Envirogas, Incorporated	Vineyard Oil & Gas Company	Envirogas, Incorporated
TOWNSHIP	McKean	City of Erie	Conneaut	Waterford	Greenfield	Washington	Washington	Waterford	Waterford	Greenfield
QUADRANGLE	Cambridge Spg., NE	Erie South	Conneaut	Waterford	North East	Edinboro North	Cambridge Spg., NE	Waterford	Cambridge Spg., NE	North East
LATITUDE	2,600 ft. S 41°57'30"	8,700 ft. S 42°07'30"	6,650 ft. S 41°55'00"	11,450 ft. S 41°57'30"	12,400 ft. S 42°10'00"	13,950 ft. S 41°57'30"	5,500 ft. S 41°57'30"	3,990 ft. S 42°00'00"	6,650 ft. S 41°57'30"	14,500 ft. S 42°10'00"
LONGITUDE	2,150 ft. W 80°05'00"	10,500 ft. W 80°02'30"	2,950 ft. W 80°30'00"	9,300 ft. W 79°57'30"	8,700 ft. W 79°45'00"	550 ft. W 80°07'30"	300 ft. W 80°05'00"	9,925 ft. W 79°52'30"	3,250 ft. W 80°02'30"	5,300 ft. W 79°45'00"
DATE COMPLETED	1-22-81	3-26-81	6-21-82	6-30-81	9-12-81	9-26-81	9-2-82	11-8-81	12-11-81	5-29-82
ELEVATION	1430 GR	789 GR	935 GR	886 GR	1380 GR	1250 GR	1400 GR	1550 GR	1550 GR	1395 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/CNL: 300-4012			GR: 200-3953 DBC: 2000-3960 CNL: 2000-3960		GR/DBC: 1900-3898 GO: 3208-3900			GR/DBC: 2209-4227 LL: 2284-4224 Laser: 3050-4150	
TULLY	2397-		1730-	2274-	2026-	2230-		2412-	2566-	2319-
ONONDAGA LIMESTONE CHERT	2611-		1885-	2485-	2216-	2440-	2598-	2635- 2822-	2788-	2516-
ORISKANY	Absent			2742-		Absent		2880-	Absent	Absent
HELDERBERG KEYSER-BASS ISLANDS	2809-			2754- 2804-	2504-	2708- 2731-		2975- 3027-	3052- 3076-	
SALINA GUELPH-LOCKPORT	2950- 3414-			2844- 3326-	2624- 2986-	2792- 3292-		3068- 3510-	3108- 3592-	2684- 3046-
CLINTON IRONDEQUOIT	3674- 3748-			3628- 3668-	3256- 3301-	3546- 3612-	3746-	3768- 3827-	3882- 3932-	3296- 3361-
MEDINA GRIMSBY WHIRLPOOL	3782- 3941-			3722- 3727- 3865-	3320- 3336- 3476-	3661- 3666- 3808-	3783 3940-	3854- 4018-	3976- 3982- 4124-	3392- 3539-
QUEENSTON	3950-			3874-	3495-	3814-	3946-	4030-	4132-	3554-
PRODUCING FORMATION	Medina			Medina		Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3798-3851			3743-3786		3685-3750	3812-3828	3882-4022	3986-4128	3442-3552
TOTAL DEPTH	4018	1810	2028	3962	3602	3905	4000	4120	4229	3660
DEEPEST FORMATION REACHED	Queenston	Oriskany	Onondaga	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,200 Mcf F 1,075 psi/48 hrs. development Reeds Corners field	3,500 Mcf Nat. 745 psi/? hrs. New pool discovery School pool Erie field	Dry and abandoned development Bushnell-Lexington pool Conneaut field	1,400 Mcf AF 1,160 psi/168 hrs. development Swails pool Drumlin field	100 Mcf AF 1,000 psi/240 hrs. development Bull Reservoir pool North East field	200 Mcf AF 700 psi/168 hs. development Edinboro field	900 Mcf AF 1,100 psi/48 hrs. development Reeds Corners field	IP not given extension Talcott pool Erie field	2,000 Mcf AF 1,100 psi/20 hrs. development Swails pool Drumlin field	1,000 Mcf AF 1,045 psi/240 hrs. development Bull Reservoir pool North East field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 21832	Erie 21836	Erie 21850	Erie 21857	Erie 21895	Erie 21896	Erie 21910	Erie 21911	Erie 21916	Erie 21939
NAME OF WELL	George Kuebal #1	Patricia Orbanick #1	L. Skarzenski #1	James H. & Jean Fabian #1	Lavern Skarzenski #2	F. Starvaggi #2	Arthur A. Rose #1	Arthur A. Rose #2	Robert Blount & Norman Hammer #1	Paul Mickle #1
OPERATOR	N.E.A. Cross Company	N.E.A. Cross Company	Envirogas, Incorporated	N.E.A. Cross Company	Envirogas, Incorporated	Envirogas, Incorporated	N.E.A. Cross Company	N.E.A. Cross Company	Cardinal Oil Company #12	Kaltsas Oil Company, Inc.
TOWNSHIP	LeBoeuf	Waterford	Greenfield	LeBoeuf	Greenfield	Greenfield	LeBoeuf	LeBoeuf	Franklin	LeBoeuf
QUADRANGLE	Waterford	Cambridge Spg., NE	North East	Waterford	North East	Wattsburg	Waterford	Waterford	Edinboro North	Cambridge Springs
LATITUDE	4,350 ft. S 41°55'00"	9,500 ft. S 41°57'30"	10,300 ft. S 42°10'00"	13,750 ft. S 41°55'00"	10,300 ft. S 42°10'00"	4,000 ft. S 42°07'30"	11,400 ft. S 41°55'00"	12,500 ft. S 41°55'00"	3,275 ft. S 41°57'30"	6,450 ft. S 41°52'30"
LONGITUDE	3,150 ft. W 79°57'30"	4,750 ft. W 80°00'00"	7,700 ft. W 79°47'30"	200 ft. W 79°57'30"	4,150 ft. W 79°47'30"	6,400 ft. W 79°45'00"	10,900 ft. W 79°55'00"	300 ft. W 79°57'30"	10,725 ft. W 80°10'00"	4,980 ft. W 80°00'00"
DATE COMPLETED	5-13-82	3-24-82	3-7-82	4-7-82	6-10-82	8-27-82	4-13-82	4-7-82	5-18-82	4-23-82
ELEVATION	1170 GR	1400 GR	1500 GR	1300 GR	1410 GR	1370 GR	1250 GR	1260 GR	1250 GR	1428 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/FOC/OBC/CNL: 2300-4036	OBC/GR: 2400-4146		GR/CNL: 2700-4265			GR/DBC: 2400-4220	GR: 2650-4208 CNL: 2650-4208 FOC: 2650-4208	FOC: 2050-3702 GR/N: 3350-3654 Laser: 3050-4150	OBC: 325-4368
TULLY	2326-	2476-	2171-		2074-	2098-	2496-		2062-	2650-
ONONDAGA LIMESTONE CHERT	2546-	2697-	2400- 2594-	2730-	2310- 2512-	2332- 2529-	2720-	2696-	2268-	2870-
ORISKANY	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	
HELDERBERG KEYSER-BASS ISLANDS	2808- 2840-	2968- 2984-	2639-	2984- 3006-		2575-	2966- 2990-	2952- 2976-	2560-	3110-
SALINA GUELPH-LOCKPORT	2882- 3368-	3056- 3506-	2744- 3115-	3054- 3610-	2669- 3028-	2670- 3052-	3036- 3588-	3024- 3544-	2638- 3140-	3183- 3732-
CLINTON IRONDEQUOIT	3652- 3707-	3764- 3824-	3386- 3427-	3860- 3928-	3298- 3341-	3310- 3365-	3856- 3910-	3828- 3884-	3388- 3440-	4016- 4072-
MEDINA GRIMSBY WHIRLPOOL	3756- 3766- 3907-	3875- 3892- 4022-	3484- 3597-	3965- 3994- 4130-	3373- 3514-	3400- 3541-	3948- 3984- 4108-	3920- 3942- 4082-	3474- 3638-	4120- 4276-
QUEENSTON	3920-	4032-	3619-	4140-	3534-	3559-	4119-	4092-	3646-	4284-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3790-3866	3914-3946	3507-3613	4018-4058	3389-3529	3427-3548	3988-4042	3980-4018	3494-3581	4143-4283
TOTAL DEPTH	4038	4032	3733	4265	3625	3643	4220	4209	3716	4369
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	3,500 Mcf AF 1,180 psi/48 hrs. development Waterford pool LeBoeuf field	500 Mcf AF 1,050 psi/2 days development Swails pool Drumlin field	IP not given extension Bull Reservoir pool North East field	3,100 Mcf AF 1,150 psi/48 hrs. development Mill Village field	200 Mcf AF 1,075 psi/240 hrs. development Bull Reservoir pool North East field	5,000 Mcf AF 1,030 psi/240 hrs. development Bull Reservoir pool North East field	4,000 Mcf AF 1,180 psi/48 hrs. development Mill Village field	8,000 Mcf AF 1,180 psi/48 hrs. development Mill Village field	IP not given 175 psi/48 hrs. development Franklin Center field	1,200 Mcf AF 1,200 psi/168 hrs. development Mill Village field

COUNTY Permit Number	Erie 21960	Erie 21975	Erie 21978	Erie 21980	Erie 21981	Erie 21985	Erie 21990	Erie 21991	Erie 21992	Erie 21998
NAME OF WELL	Dominick P. Semantelli #1	Anna D. Silfies #1	Peters & Kohmanski #1	Leo S. Stetson #1	Raymond & Joyce Swab #1	Goldsmith #1	Anthony Burgett #1	Hurst-Cairns #1	Roger A. Woods #1	Neil R. & Carolyn Euliano #1
OPERATOR	N.E.A. Cross Company	Northwest Natural Gas Company	O. W. & K. Associates	N.E.A. Cross Company	N.E.A. Cross Company	C & C Troyer Brothers #60	C & C Troyer Brothers #63	C & C Troyer Brothers #62	C & C Troyer Brothers #64	N.E.A. Cross Company
TOWNSHIP	Waterford	Conneaut	Mill Village	LeBoeuf	Waterford	Waterford	Washington	Waterford	Washington	Washington
QUADRANGLE	Cambridge Spg., NE	Conneautville	Waterford	Waterford	Cambridge Spg., NE	Waterford	Edinboro North	Waterford	Edinboro North	Cambridge Spgs, NE
LATITUDE	11,400 ft. S 41°57'30"	1,950 ft. S 41°52'30"	13,250 ft. S 41°55'00"	3,000 ft. S 41°55'00"	10,250 ft. S 41°57'30"	2,650 ft. S 41°57'30"	7,850 ft. S 41°55'00"	2,000 ft. S 41°57'30"	6,000 ft. S 41°55'00"	7,900 ft. S 41°55'00"
LONGITUDE	1,650 ft. W 80°00'00"	2,750 ft. W 80°20'00"	4,850 ft. W 79°57'30"	650 ft. W 79°57'30"	2,150 ft. W 80°00'00"	3,700 ft. W 79°57'30"	9,650 ft. W 80°07'30"	4,800 ft. W 79°57'30"	9,650 ft. W 80°07'30"	6,400 ft. W 80°05'00"
DATE COMPLETED	7-13-82	10-16-82	7-20-82	6-7-82	6-29-82	5-8-82	5-23-82	5-15-82	5-19-82	7-26-82
ELEVATION	1350 GR	1080 GR	1190 GR	1225 GR	1320 GR	1200 GR	1255 GR	1250 GR	1200 GR	1385 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/OBC: 2350-4088 CNL: 2350-4088		GR/OBC: 2300-4124	GR/OBC: 2300-4031	GR/OBC: 2099-4100	OBC/LL: 2100-3833	OBC/GR: 2250-4046	OBC: 2150-3906	OBC/LL: 3690-3730	GR/OBC: 2172-4149
TULLY	2404-	1998-	2402-	2314-	2410-	2100-	2286-	2174-	2214-	2448-
ONONDAGA LIMESTONE	2626-	2176-	2628-	2533-	2631-	2324-	2492-	2398-	2422-	2664-
ONONDAGA CHERT										
ORISKANY	2888-		Absent	2784-	Absent	Absent		2662-	Absent	Absent
HELDERBERG			2878-	2790-	2910-	2584-	2690-	2684-	2720-	2936-
KEYSER-BASS ISLANDS	2906-	2434-	2886-	2828-	2934-	2626-	2728-	2714-	2726-	2956-
SALINA	2968-	2502-	2988-	2868-	2990-	2700-	2832-	2776-	2776-	3004-
GUELPH-LOCKPORT	3470-	3039-	3476-	3356-	3448-	3204-	3356-	3280-	3278-	3544-
CLINTON	3744-	3272-	3739-	3681-	3724-	3472-	3648-	3564-	3540-	3810-
IRONDEQUOIT	3792-		3796-	3736-	3780-	3538-	3698-	3616-	3614-	3860-
MEDINA	3840-	3400-	3848-	3770-	3826-	3572-	3740-	3662-	3664-	3912-
GRIMSBY	3852-		3855-	3806-	3836-	3588-	3755-	3670-	3685-	3924-
WHIRLPOOL	3995-		3998-	3934-	3980-	3732-	3894-	3810-	3814-	4055-
QUEENSTON	4005-	3575-	4006-	3943-	3990-	3742-	3904-	3816-	3826-	4064-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3877-3918	3457-3492	3883-3933	3777-3841	3852-3898	3613-3690	3762-3812	3680-3754	3762-3812	3927-3976
TOTAL DEPTH	4088	3630	4124	4029	4102	3835	4054	3914	3945	4064
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	4,000 Mcf AF 1,180 psi/48 hrs. development Swails pool Drumlin field	1,100 Mcf AF 970 psi/48 hrs. development Lundys Lane pool Conneaut field	2,800 Mcf AF 1,000 psi/48 hrs. development Mill Village field	200 Mcf AF 1,160 psi/48 hrs. development Waterford pool LeBoeuf field	500 Mcf AF 1,020 psi/48 hrs. development Swails pool Drumlin field	2,200 Mcf AF 1,120 psi/? hrs. development Waterford pool LeBoeuf field	1,000 Mcf AF 1,100 psi/? hrs. development Edinboro field	2,000 Mcf AF 1,100 psi/? hrs. development Waterford pool LeBoeuf field	2,000 Mcf AF 1,150 psi/? hrs. development Franklin Center field	200 Mcf AF 1,100 psi/48 hrs development Edinboro field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 22006	Erie 22016	Erie 22023	Erie 22026	Erie 22027	Erie 22030	Erie 22032	Erie 22047	Erie 22067	Erie 22073
NAME OF WELL	Zimmerly #4	Oavid Knight #1	C. Counasse #1	Richard Geber #1	Leo A. Pfadt #1	Shirley McLaughlin #4	Frank Page #1	Lovett #1	Kathleen McOowell #1	Neimeyer #3
OPERATOR	Vineyard Oil & Gas Company	C & C Troyer Brothers #66	Envirogas, Incorporated	O.W. & K. Associates	N.E.A. Cross Company	N.E.A. Cross Compeny	Cross Resources Company	Petro Eveluetion Services, Inc.	N.E.A. Cross Company	NRM Petroleum Corporation
TOWNSHIP	Waterford	Franklin	Wayne	Waterford	Waterford	Mill Villege	Waterford	Washington	Waterford	Waterford
QUADRANGLE	Cembridge Spg., NE	Edinboro North	Corry	Waterford	Waterford	Waterford	Waterford	Cembridge Spg., NE	Waterford	Waterford
LATITUDE	6,800 ft. S 41°57'30"	2,450 ft. S 41°57'30"	2,100 ft. S 42°00'00"	13,950 ft. S 42°00'00"	1,200 ft. S 41°57'30"	12,100 ft. S 41°55'00"	3,550 ft. S 41°57'30"	3,100 ft. S 41°55'00"	13,900 ft. S 41°57'30"	6,875 ft. S 41°57'30"
LONGITUDE	4,500 ft. W 80°02'30"	1,450 ft. W 80°10'00"	2,700 ft. W 79°40'00"	8,800 ft. W 79°55'00"	10,700 ft. W 79°57'30"	1,750 ft. W 79°57'30"	50 ft. W 79°57'30"	10,900 ft. W 80°05'00"	8,400 ft. W 79°57'30"	1,400 ft. W 79°57'30"
DATE COMPLETED	7-9-82	5-30-82	6-12-82	6-7-82	6-26-82	7-27-82	7-17-82	9-14-82	7-11-82	8-12-82
ELEVATION	1575 CR	1270 GR	1530 GR	1370 GR	1380 GR	1230 GR	1275 GR	1280 GR	1225 GR	1184 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/OLL: 302-4154	FOC/GR: 2250-4000		GR/OBC: 2100-4042 CNL: 2100-4055	GR/OBC: 1995-4005 PCL: 3752-3814	GR/FDC: 2040-4078	GR/OBC: 215-3968	OBC/GR: 250-400, 2200-3950	GR/OBC: 2250-4050	DBC/SNP: 1840-3838 OLL: 1840-3839 Laser: 3500-3800
TULLY	2561-	2290-	2597-	2308-	2209-	2424-	2190-	2272-	2286-	2098-
ONONDAGA LIMESTONE CHERT	2778-	2494-	2846- 3016-	2534-	2430-	2648-	2413-	2484-	2504-	2320-
ORISKANY	Absent		Absent	2792-	2700-	Absent	2670-	2758-	Absent	2574-
HELDERBERG KEYSER-BASS ISLANDS	3048- 3084-	2768- 2796-	3060-	2812- 2826-	2728- 2752-	2902- 2928-	2696- 2714-	2766- 2780-	2762- 2788-	2586- 2610-
SALINA GUELPH-LOCKPORT	3112- 3600-	2842- 3328-	3175- 3700-	2898- 3420-	2822- 3342-	2968- 3490-	2781- 3316-	2830- 3326-	2896- 3388-	2672- 3210-
CLINTON IRONDEQUOIT	3872- 3920-	3592- 3670-	3956- 4018-	3682- 3734-	3610- 3656-	3776- 3830-	3564- 3626-	3616- 3670-	3656- 3708-	3488- 3548-
MEDINA GRIMSBY WHIRLPOOL	3964- 3973- 4116-	3718- 3722- 3866-	4056- 4202-	3770- 3798- 3932-	3710- 3742- 3856-	3864- 3888- 4030-	3660- 3694- 3822-	3720- 3730- 3866-	3762- 3774- 3906-	3578- 3618- 3738-
QUEENSTON	4126-	3878-	4222-	3942-	3870-	4038-	3830-	3872-	3918-	3748-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medine	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3993-4120	3738-3784	4082-4218	3815-3872	3752-3814	3924-3946	3712-3765	3736-3806	3786-3844	3619-3671
TOTAL DEPTH	4185	4006	4297	4042	3995	4078	3968	3950	4052	3840
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Oueenston	Queenston	Oueenston	Oueenston	Oueenston	Oueenston	Oueenston
RESULTS	520 Mof AF 985 psi/720 hrs. development Reeds Corners field	1,500 Mcf AF 1,100 psi/? hrs. development Franklin Center field	IP not given development Corry field	2,900 Mcf AF 1,180 psi/48 hrs. development Talcott pool Erie field	3,000 Mcf AF 1,200 psi/48 hrs. development Swails pool Drumlin field	4,000 Mof AF 1,180 psi/48 hrs. development Mill Village field	3,500 Mof AF 1,180 psi/48 hrs. development Waterford pool LeBoeuf field	1,200 Mcf AF 1,050 psi/72 hrs. development Edinboro field	2,800 Mcf AF 1,120 psi/48 hrs. development Swails pool Orumlin field	52 Mof Net. 411 Mcf AF 1,100 psi/4 hrs. development Waterford pool LeBoeuf field

COUNTY Permit Number	Erie 22084	Erie 22085	Erie 22089	Erie 22110	Erie 22112	Erie 22126	Erie 22135	Erie 22137	Erie 22170	Erie 22209
NAME OF WELL	Marie & Willie Stafford #1	Charles E. Thompson #1	William J. & Joan Wurst #2	Joseph Bilski #2	Albert O'Connell #1	Robert & Barbara Rindfuss #2	Charles H. Kibbe #1	Merle Willey #2 #1	Herman Zielinski #1	E. Cornish #1
OPERATOR	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	Kelteee Oil Company, Inc.	N.E.A. Cross Company	Rindfuss Well Drilling #25	NRM Petroleum Corporation	NRM Petroleum Corporation	NRM Petroleum Corporation	Envirogas, Incorporated
TOWNSHIP	Waterford	LeBoeuf	LeBoeuf	Venango	LeBoeuf	LeBoeuf	Waterford	Waterford	Waterford	Wayne
QUADRANGLE	Cambridge Spg., NE	Cambridge Spg., NE	Miller's Station	Hammett	Waterford	Waterford	Waterford	Waterford	Waterford	Corry
LATITUDE	3,400 ft. S 41°57'30"	6,500 ft. S 41°55'00"	6,800 ft. S 41°52'30"	3,390 ft. S 42°05'00"	7,550 ft. S 41°55'00"	11,400 ft. S 41°55'00"	9,300 ft. S 42°00'00"	900 ft. S 41°55'00"	650 ft. S 41°57'30"	3,050 ft. S 42°00'00"
LONGITUDE	6,850 ft. W 80°02'30"	850 ft. W 80°00'00"	9,600 ft. W 79°52'30"	5,600 ft. W 79°52'30"	250 ft. W 79°55'00"	10,350 ft. W 79°57'30"	3,780 ft. W 79°57'30"	2,520 ft. W 79°55'00"	5,920 ft. W 79°57'30"	9,900 ft. W 79°42'30"
DATE COMPLETED	8-17-82	8-10-82	7-19-82	1-10-83	8-26-82	6-28-83	8-22-82	8-28-82	9-3-82	9-14-82
ELEVATION	1540 GR	1280 GR	1630 GR	1400 GR	1250 GR	1155 GR	1260 GR	1230 GR	1240 GR	1750 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR 2500-4155 DBC: 2500-4166 CAL: 2500-4160	GR/DBC: 2350-4135	GR/OBC: 2900-4660		GR/OBC: 2300-4072 CNL: 2300-4072	FOC/GR: 2550-3934 PCL: 2900-3940	GR: 2000-3864 FOC: 2000-3870 IL: 2050-3867 CNL: 2000-3861	OBC/GR: 2100-4100 DLL: 2100-4102	DBC/GR/GD: 2100-4100	FOC/GR: 294-4461 1450-4464
TULLY	2506-	2412-	2950-	2150-	2398-	2360-	2098-	2313-	2086-	2772-
ONONDAGA LIMESTONE CHERT	2722-	2632-	3172-	2378-	2576-	2562-	2318-	2540-	2306-	3012-
ORISKANY	Absent	Absent	Absent		Absent	Absent	2578-	Absent	2566-	Absent
HELDERBERG KEYSER-BASS ISLANDS	2998- 3020-	2900- 2926-	3394- 3414-		2818- 2842-	2753-	2598- 2618-	2782- 2818-	2588- 2608-	3232- 3282-
SALINA GUELPH-LOCKPORT	3070- 3542-	2966- 3446-	3454- 3988-	2704- 2950-	2888- 3470-	2814- 3430-	2684- 3190-	2858- 3386-	2650- 3200-	3325- 3848-
CLINTON IRONDEQUOIT	3818- 3875-	3764- 3818-	4296- 4354-	3443-	3721- 3788-	3690- 3742-	3470- 3520-	3672- 3722-	3474- 3526-	4128- 4183-
MEDINA GRIMSBY WHIRLPOOL	3922- 3936- 4068-	3844- 3878- 4022-	4398- 4436- 4552-	3459 3616-	3826- 3849- 3986-	3778- 3892-	3554- 3570- 3712-	3756- 3814- 3916-	3548- 3578- 3718-	4230- 4245- 4374-
QUEENSTON	4074-	4030-	4566-	3623-	3988-	3906-	3720-	3928-	3728-	4386-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3938-3985	3890-3966	4453-4499	3505-3621	3878-3932	3803-3900	3585-3659	3585-3659	3584-3664	4247-4316
TOTAL DEPTH	4160	4136	4660	3702	4072	3945	3871	4110	3850	4464
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	500 Mcf AF 1,120 psi/48 hrs. development Reeds Corners field	2,000 Mcf AF 1,020 psi/48 hrs. development Mill Village field	3,000 Mcf AF 1,270 psi/48 hrs. development New Ireland field	200 Mcf AF 1,000 psi/48 hrs. development Hornby pool North East field	1,000 Mcf AF 1,120 psi/48 hrs. development Waterford pool LeBoeuf field	500 Mcf AF 650 psi/24 hrs. development Mill Village field	875 Mcf AF 1,000 psi/4 hrs. development Talcott pool Erie field	875 Mcf AF 1,100 psi/4 hrs. development Waterford pool LeBoeuf field	1,237 Mcf AF 1,200 psi/4 hrs. development Waterford pool LeBoeuf field	1,000 Mcf AF 1,095 psi/240 hrs. development Carter Hill field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 22218	Erie 22220	Erie 22235	Erie 22236	Erie 22241	Erie 22246	Erie 22247	Erie 22248	Erie 22250	Erie 22260
NAME OF WELL	Leones Millerius #1	Joseph Semple #1	Mary Zajac #1	Lewis Dove #1	Burns-Wright #1	H. Van Tessell #1	John Rutkowski #1	Ed Lopus #1	Emery Metzler #1	W. Gertnar #1
OPERATOR	Petro Evaluation Services	Petro Evaluation Services	C & C Troyer Brothers #75	C & C Troyer Brothers #74	Petro Evaluation Services	Envirogas, Incorporated	Vineyard Oil & Gas Company	C & C Troyer Brothers #76	C & C Troyer Brothers #77	Envirogas. Incorporated
TOWNSHIP	Franklin	Franklin	Union	Waterford	Franklin	Wayne	Waterford	Waterford	Waterford	Greenfield
QUADRANGLE	Edinboro North	Albion	Union City	Waterford	Edinboro North	Corry	Cambridge Spg., NE	Waterford	Cambridge Spg., NE	Wattsburg
LATITUDE	1,350 ft. S 41°55'00"	5,140 ft. S 41°55'00"	13,000 ft. S 41°57'30"	15,000 ft. S 42°00'00"	4,410 ft. S 41°55'00"	8,700 ft. S 42°00'00"	13,450 ft. S 41°57'30"	6,900 ft. S 41°57'30"	14,100 ft. S 41°57'30"	1,950 ft. S 42°07'30"
LONGITUDE	5,050 ft. W 80°12'30"	2,410 ft. W 80°15'00"	4,600 ft. W 79°45'00"	11,000 ft. W 79°55'00"	7,830 ft. W 80°12'30"	4,000 ft. W 79°40'00"	3,200 ft. W 80°02'30"	5,750 ft. W 79°57'30"	3,900 ft. W 80°02'30"	5,750 ft. W 79°45'00"
DATE COMPLETED	11-6-82	11-16-82	9-18-82	9-14-82	11-27-82	10-10-82	12-3-82	9-23-82	9-29-82	9-7-82
ELEVATION	1268 GR	1220 GR	1560 GR	1330 GR	1285 GR	1700 GR	1520 GR	1180 GR	1490 GR	1375 GR
LOGS RECEIVED AND LOGGED INTERVALS	DBC/GR: 250-3772	DBC: 2600-3650	DBC/GR: 2750-4530	DBC/GR: 2100-3944	GR/DBC: 250-3793	GR/DBC: 312-4508 DLL: 0-4522		FDC/GR: 2000-3866 PCL: 3590-3655	DBC/GR: 2500-4220	
TULLY	2142-		2800-	2226-	2154-	2805-	2550-	2072-	2550-	2057-
ONONDAGA LIMESTONE CHERT	2344-		3038-	2444-	2356-	3056-	2850-	2292-	2768-	2292- 2488-
ORISKANY	2632-			2712-	Absent	Absent	3020-	2560-		Absent
HELDERBERG KEYSER-BASS ISLANDS	2636- 2656-		3220-	2730- 2786-	2638- 2666-	3258- 3280-	3040-	2572- 2608-	3044-	2539-
SALINA GUELPH-LOCKPORT	2712- 3182-	2656- 3148-	3328- 3876-	2820- 3344-	2712- 3206-	3334- 3904-	3080- 3530	2662- 3186-	3106- 3600-	2641- 3013-
CLINTON IRONDEQUOIT	3456- 3506-	3426- 3480-	4128- 4198-	3593- 3654-	3478- 3534-	4155- 4216-	3940-	3468- 3524-	3843- 3922-	3287- 3330-
MEDINA GRIMSBY WHIRLPOOL	3552- 3560- 3702-	3506- 3538- 3628-	4237-4353 4392-	3698-3784 3850-	3582- 3584- 3730-	4254- 4290- 4410-	3960- 4120-	3558- 3584- 3718-	3964-4046 4112-	3365- 3504-
QUEENSTON	3708-	3634-	4412-	3862-	3737-	4422-	4130-	3726-	4128-	3526-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3562-3608	3529-3590	4294-4348	3745-3808	3584-3648	4293-4416	3990-4129	3590-3655	3994-4042	3392-3522
TOTAL DEPTH	3772	3652	4513	3965	3795	4525	4260	3866	4230	3604
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	50 Mcf Nat. 640 Mcf AF 1,070 psi/72 hrs. development Franklin Center field	35 Mcf Nat. 880 Mcf AF 1.120 psi/72 hrs. development Pageville pool Conneaut field	200 Mcf AF 1,100 psi/168 hrs. development Terbell pool Corry field	3,000 Mcf AF 1,150 psi/168 hrs. development Waterford pool LeBoeuf field	490 Mcf AF 990 psi/72 hrs. development Franklin Center field	553 Mcf AF 1,175 psi/48 hrs. development Spencer Creek pool Corry	2,100 Mcf AF 1,020 psi/72 hrs. development Edinboro North field	2,000 Mcf AF 1,150 psi/168 hrs. development Waterford pool LeBoeuf	1,750 Mcf AF 1.100 psi/168 hrs. development Edinboro North field	3,000 Mcf AF 1,000 psi/240 hrs. development Bull Reservoir pool North East

COUNTY Parmit Number	Erie 22267	Erie 22277	Erie 22280	Erie 22303	Erie 22304	Erie 22316	Erie 22317	Erie 22321	Erie 22322	Erie 22324
NAME OF WELL	John Dubowski #1	Mathew Kania #1	Frank & Dorothy Wagner #1	Richard Stutzman #2	Howard Rohda #1	George Daley #1	Ray J. Salmon #1	L. Kalika #1	L. Kalika #2	G. Feucht #1
OPERATOR	LeBoeuf Energy, Incorporated	NRM Petroleum Corporation	NRM Petroleum Corporation	C & C Troyer Brothers #79	C & C Troyer Brothers #78	NRM Petroleum Corporation	NRM Petroleum Corporation	Envirogas, Incorporated	Envirogas, Incorporated	Envirogas, Incorporated
TOWNSHIP	LeBoeuf	Green	Green	Wayne	Amity	LeBoeuf	LeBoeuf	Wayne	Wayne	Wayne
QUADRANGLE	Cambridge Spg., NE	Hammett	Hammett	Corry	Union City	Waterford	Waterford	Corry	Corry	Corry
LATITUDE	4,000 ft. S 41°55'00"	15,000 ft. S 42°07'30"	1,875 ft. S 40°02'30"	6,800 ft. S 42°00'00"	8,900 ft. S 42°00'00"	12,350 ft. S 41°55'00"	11,600 ft. S 41°55'00"	9,800 ft. S 40°00'00"	10,800 ft. S 42°00'00"	7,100 ft. S 42°00'00"
LONGITUDE	4,700 ft. W 80°00'00"	7,950 ft. W 79°52'30"	7,500 ft. W 79°55'00"	10,200 ft. W 79°42'30"	7,300 ft. W 79°45'00"	5,550 ft. W 78°55'00"	1,800 ft. W 79°55'00"	9,200 ft. W 79°40'00"	7,400 ft. W 79°40'00"	1,900 ft. W 79°40'00"
DATE COMPLETED	11-27-82	11-21-82	11-30-82	10-6-82	10-13-82	1-7-83	11-5-82	11-29-82	10-31-82	10-17-82
ELEVATION	1525 GR	1358 GR	1275 GR	1690 GR	1320 GR	1350 GR	1330 GR	1865 GR	1870 GR	1490 GR
LOGS RECEIVED AND LOGGED INTERVALS		DBC: 2000-3658 OLL: 2000-3656 Laser: 3390-3500	GR/DBC: 2000-3711	OBC: 2497-4426	IL: 2100-4120	GR: 2950-4200 DBC: 2950-4296	GR/DBC: 2350-4247 T: 2350-4248 IL: 2650-4245	GR/DBC: 0-4675 DLL: 293-4564	GR/FDC: 0-4682 DLL: 2648-4672	GR/FDC: 0-4329 DLL: 2317-4317
TULLY	2605-	2072-	2016-	2752-	2382-		2504-	2969-	2991-	2576-
ONONDAGA LIMESTONE CHERT	2820-	2294-	2240-	2998-	2624-		2734-	3205-	3242-	2829-
ORISKANY	3086-	2490-	2488-		Absent	Absent	Absent	Absent	Absent	Absent
HELDERBERG KEYSER-BASS ISLANDS	3100-	2500- 2560-	2498- 2534-	3220- 3272-	2850-	3018- 3044-	2982- 3002-	3420- 3446-	3446- 3472-	3040- 3066-
SALINA GUELPH-LOCKPORT	3150- 3690-	2626- 2966-	2582- 3102-	3305- 3836-	2936- 3440-	3086- 3620-	3056- 3600-	3492- 4048-	3516- 4084-	3112- 3684-
CLINTON IRONDEQUOIT	3960- 4024-	3304- 3352-	3346- 3388-	4100- 4154-	3732- 3775-	3910- 3980-	3882- 3988-	4314- 4366-	4332- 4396-	3938- 4000-
MEDINA GRIMSBY WHIRLPOOL	4054- 4220-	3384- 3414- 3536-	3440- 3466- 3572-	4202-4300 4346-	3810- 3834- 3964-	4018- 4040- 4176-	3998- 4000- 4136-	4404- 4428- 4554-	4438- 4484- 4586-	4040- 4064- 4190-
QUEENSTON	4229-	3546-	3588-	4360-	3976-	4191-	4150-	4570-	4599-	4203-
PRODUCING FORMATION	Queenston	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4093-4227	3415-3542	3467-3541	4268-4314	3850-3889	4053-4122	4162-4232	4465-4564	4486-4592	4084-4198
TOTAL DEPTH	4326	3660	3713	4414	4120	4297	4248	4679	4682	4332
DEEPEST FORMATION REACHED	Medina	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,700 Mcf AF 1,060 psi/72 hrs. development Mill Village field	1,073 Mcf AF 800 psi/96 hrs. development Hornby pool North East field	411 Mcf AF 1,025 psi/4 hrs. extension Goddard pool Erie field	700 Mcf AF 1,100 psi/168 hrs. development Carter Hill field	1,000 Mcf AF 1,100 psi/168 hrs. development Corry field	2,398 Mcf AF 1,100 psi/4 hrs. development Waterford pool LeBoeuf field	3,033 Mcf AF 1,000 psi/4 hrs. development New Ireland field	500 Mcf AF 1,160 psi/240 hrs. development Spencer Creek pool Corry field	300 Mcf AF 995 psi/240 hrs. development Spencer Creek pool Corry field	231 Mcf AF 1,160 psi/? development Spencer Creek pool Corry field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 22326	Erie 22327	Erie 22340	Erie 22343	Erie 22344	Erie 22346	Erie 22358	Erie 22360	Erie 22362	Erie 22363
NAME OF WELL	Rutkowski #2	David C. Saur #1	Mike Kaschak, Jr. #1	C. Borstorff #1	C. Borstorff #2	Donald Troyer #2	Sauers #1	G. E. Loomis #2	A. Klobusnik #1	O. Sherman #1
OPERATOR	Vineyard Oil & Gas Company	Mitch-Well Energy, Corporation	NRM Petroleum Corporation	Envirogas, Incorporated	Envirogas, Incorporated	C & C Troyer Brothers #80	Vineyard Oil & Gas Company	Goe Pro, Incorporated	Envirogas, Incorporated	Envirogas, Incorporated
TOWNSHIP	Waterford	Waterford	Green	Wayne	Wayne	Union	LeBoeuf	Conneaut	Elk Creek	Elk Creek
QUADRANGLE	Cambridge Spg., NE	Waterford	Hammett	Corry	Corry	Union City	Cambridge Spg., NE	E. Springfield	Albion	Albion
LATITUDE	13,550 ft. S 41°57'30"	11,800 ft. S 42°00'00"	8,180 ft. S 42°02'30"	11,300 ft. S 42°00'00"	9,900 ft. S 42°00'00"	12,500 ft. S 41°57'30"	9,800 ft. S 41°55'00"	14,550 ft. S 41°55'00"	5,250 ft. S 41°55'00"	8,800 ft. S 41°55'00"
LONGITUDE	1,900 ft. W 80°00'00"	4,650 ft. W 79°55'00"	350 ft. W 79°57'30"	7,900 ft. W 79°37'30"	6,050 ft. W 79°37'30"	300 ft. W 78°47'30"	6,300 ft. W 80°00'00"	8,300 ft. W 80°22'30"	6,400 ft. W 80°17'30"	7,350 ft. W 80°17'30"
DATE COMPLETED	10-14-82	12-12-82	12-28-82	11-14-82	10-26-82	10-8-82	10-24-82	11-16-82	10-4-82	10-6-82
ELEVATION	1535 GR	1475 GR	1310 GR	1650 GR	1650 GR	1510 GR	1525 GR	861 GR	1095 GR	1110 GR
LOGS RECEIVED AND LOGGED INTERVALS		GR/OBC: 2350-4086 CNL: 2350-4075 GO: 3750-4086	GR/OBC: 2050-3779 T: 2050-3780 IL: 2200-3700	GR/OBC: 0-4505 DLL: 1050-4494	GR/OBC: 0-4530 DLL: 2518-4518	DBC: 2449-4449				
TULLY	2480-	2360-	2164-	2791-	2806-	2740-	2620-	1736-	1960-	1985-
ONONDAGA LIMESTONE CHERT	2750-	2590-	2292-	3050-	3062-	2978-	2846-	1908-	2148-	2170-
ORISKANY	3030-	Absent	2542-	Absent	Absent				Absent	2424-
HELDERBERG KEYSER-BASS ISLANDS	3050-	2852- 2870-	2562- 2582-	3260- 3284-	3266- 3294-	3196-	3098-		2410-	2434-
SALINA GUELPH-LOCKPORT	3140-	2934- 3480-	2644- 3148-	3326- 3904-	3334- 3908-	3256- 3810-	3215- 3731-	2522- 2780-	2542- 3004-	2550- 3054-
CLINTON IRONDEQUOIT		3738- 3792-	3410- 3460-	4156- 4218-	4162- 4227-	4065- 4126-	3939- 4058-	3008- 3120-	3280- 3336-	3310- 3360-
MEDINA GRIMSBY WHIRLPOOL		3844- 3854- 3990-	3511- 3512- 3644-	4258- 4286- 4408-	4267- 4292- 4420-	4164-4242 4322-	4080- 4245-	3163- 3310-	3377- 3511-	3404- 3540-
QUEENSTON		4001-	3661-	4420-	4433-	4338-	4260-	3329-	3536-	3566-
PRODUCING FORMATION	Salina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3030-3340	3873-3939	3520-3590	4288-4370	4297-4427	4248-4332	4120-4254	3170-3257	3398-3532	3405-3563
TOTAL DEPTH	3340	4118	3780	4508	4530	4448	4344	3390	3631	3660
DEEPEST FORMATION REACHED	Salina	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	3,000 Mcf AF 800 psi/24 hrs. Shallower pool discovery Conneauttee pool Edinboro North	3,800 Mcf AF 1,100 psi/48 hrs. development Talcott pool Erie	239 Mcf AF 850 psi/4 hrs. extension Goddard pool Erie	1,000 Mcf AF 1,200 psi/240 hrs. development Brokenstraw field	400 Mcf AF 1,210 psi/240 hrs. development Brokenstraw field	1,000 Mcf AF 1,100 psi/168 hrs. development Bentley Run pool Union City	IP not given 1,280 psi/72 hrs. development Edinboro North field	450 Mcf AF 800 psi/24 hrs. development Bushnell-Lexington pool Conneaut	2,000 Mcf AF 1,055 psi/240 hrs. development Lundys Lane pool Conneaut	1,000 Mcf AF 1,065 psi/240 hrs. development Lundys Lane pool Conneaut

COUNTY Permit Number	Erie 22370	Erie 22375	Erie 22394	Erie 22395	Erie 22396	Erie 22411	Erie 22415	Erie 22416	Erie 22417	Erie 22423
NAME OF WELL	Lawrence & Cecelia Yeple #1	Aloysius Rinderle #1	Max & Mae Brown #1	George & Florence Daley #2	Michael Popovich #2	Willia Czeenowski #1	P. Tutak #1	E. Fletcher #1	J. Ree #1	Martha Smith #1
OPERATOR	NRM Petroleum Corporation	Mitch-Well Energy, Incorporated	NRM Petroleum Corporation	NRM Petroleum Corporation	NRM Petroleum Corporation	Robert H. Brace	Envirogas, Incorporated	Envirogas, Incorporated	Envirogas, Incorporated	Mitch-Well Energy, Corporation
TOWNSHIP	Green	Waterford	LeBoeuf	LeBoeuf	LeBoeuf	Waterford	Elk Creek	Elk Creek	Elk Creek	Waterford
QUADRANGLE	Hammett	Waterford	Miller's Station	Waterford	Waterford	Cambridge Spg., NE	Albion	Albion	Albion	Waterford
LATITUDE	10,960 ft. S 42°02'30"	6,300 ft. S 41°57'30"	2,500 ft. S 41°52'30"	12,220 ft. S 41°55'00"	14,230 ft. S 41°55'00"	13,400 ft. S 42°00'00"	7,000 ft. S 41°55'00"	14,650 ft. S 41°57'30"	14,250 ft, S 41°57'30"	4,600 ft. S 41°57'30"
LONGITUDE	10,300 ft. W 79°55'00"	650 ft. W 79°57'30"	7,210 ft. W 79°55'00"	6,980 ft, W 79°55'00"	10,170 ft. W 79°52'30"	1,100 ft. W 80°02'30"	7,150 ft. W 80°17'30"	2,200 ft. W 80°17'30"	8,250 ft. W 80°17'30"	2,050 ft. W 79°57'30"
DATE COMPLETED	1-12-83	12-13-82	11-10-82	11-17-82	11-11-82	11-3-82	11-16-82	12-9-82	11-20-82	12-29-82
ELEVATION	1370 GR	1215 GR	1465 GR	1363 GR	1428 GR	1320 GR	1110 GR	1110 GR	1060 GR	1190 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/OBC: 2100-3867 IL: 2300-3804	GR/DBC: 2200-3878 PCL: 3440-3836	GR/OBC: 2700-4482 IL: 3000-4480	FOC/CAL: 2500-4282 IL: 2500-4280 GR: 2500-4276	GR/DBC: 2600-4392 IL: 2600-4389 T: 2600-4393					GR/CNL: 2250-3794 OBC: 2250-3805 GO: 2250-3810
TULLY	2140-	2130-	2732-	2548-	2640-	2250-	1980-	1932-	1870-	
ONONDAGA LIMESTONE CHERT	2367-	2354-	2957-	2772-	2872-	2485-	2168-	2124-	2060-	2306-
ORISKANY	2614-		Absent	Absent	Absent		2424-	2395-		Absent
HELDERBERG KEYSER-BASS ISLANDS	2632- 2648-	2611-	3182- 3204-	3018- 3046-	3104- 3120-		2438-	2402-	2320-	2596- 2626-
SALINA GUELPH-LOCKPORT	2690- 3224-	2702- 3244-	3250- 3800-	3086- 3602-	3178- 3758-		2546- 3042-	2520- 3020-	2460- 2954-	2682- 3208-
CLINTON IRONDEQUOIT	3494- 3540-	3504- 3578-	4090- 4140-	3918- 3982-	4032- 4084-	3624-	3306- 3357-	3270- 3320-	3210- 3256-	3464- 3520-
MEDINA GRIMSBY WHIRLPOOL	3594- 3602- 3724-	3618- 3771-3782	4180- 4211- 4338-	4040- 4042- 4176-	4124- 4146- 4284-	3646- 3786-	3400- 3536-	3346- 3496-	3280- 3434-	3572- 3574- 3708-
QUEENSTON	3742-	3782-	4357-	4192-	4300-	3798-	3558-	3522-	3457-	3724-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3595-3674	3647-3776	4215-4296	4046-4105	4162-4297	3694-3732	3402-3556	3380-3518	3299-3453	3607-3669
TOTAL DEPTH	3868	3888	4483	4283	4393	3903	3659	3623	3551	3800
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,639 Mcf AF 1,000 psi/4 hrs. development Goddard pool Erie field	3,200 Mcf AF 1,025 psi/48 hrs. development Waterford pool LeBoeuf field	169 Mcf AF 800 psi/4 hrs. development New Ireland field	2,698 Mcf AF 1,200 psi/4 hrs. development Waterford pool LeBoeuf field	3,816 Mcf AF 800 psi/4 hrs. development New Ireland field	1,000 Mcf AF 1,050 psi/168 hrs. extension Swalls pool Drumlin field	200 Mcf AF 950 psi/240 hrs. development Lundys Lane pool Conneaut field	100 Mcf AF 950 psi/240 hrs. development Lundys Lane pool Conneaut field	87 Mcf AF 975 psi/240 hrs. development Bushnell-Lexington pool Conneaut field	7,000 Mcf AF 1,025 psi/48 hrs development Waterford pool LeBoeuf field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 22424	Erie 22430	Erie 22431	Erie 22432	Erie 22437	Erie 22438	Erie 22450	Erie 22455	Erie 22456	Erie 22457
NAME OF WELL	Anthony & Virginia Falkowski #1	Francis Strobel #1	Herbert Miller #3	Alan I. Renkis #1	Sauers #2	McCall #4	Thomas McGahen #1	F. Wingerter #1	Robert & Lois Clarkson #2	Robert & Lois Clarkson #1
OPERATOR	Mitch-Well Energy, Corporation	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Alan I. Renkis	Vineyard Oil & Gas Company	Robert H. Brace	LeBoeuf Energy, Incorporated	Envirogas, Incorporated	NRM Petroleum Corporation	NRM Petroleum Corporation
TOWNSHIP	Washington	Greenfield	Greenfield	Millcreek	LeBoeuf	Waterford	LeBoeuf	Elk Creek	Waterford	Waterford
QUADRANGLE	Cambridge Spg., NE	Wattsburg	Wattsburg	Swanville	Cambridge Spg., NE	Cambridge Spg., NE	Cambridge Spg., NE	Albion	Cambridge Spg., NE	Cambridge Spg., NE
LATITUDE	9,900 ft. S 41°57'30"	7,740 ft. S 42°07'30"	6,610 ft. S 42°07'30"	500 ft. S 42°10'00"	8,550 ft. S 41°55'00"	12,200 ft. S 41°57'30"	3,600 ft. S 41°55'00"	14,350 ft. S 41°57'30"	9,650 ft. S 41°57'30"	8,450 ft. S 41°57'30"
LONGITUDE	2,800 ft. W 80°05'00"	9,990 ft. W 79°47'30"	5,720 ft. W 79°47'30"	9,550 ft. W 80°10'00"	5,700 ft. W 80°00'00"	100 ft. W 80°00'00"	3,700 ft. W 80°00'00"	400 ft. W 80°17'30"	7,820 ft. W 80°00'00"	7,100 ft. W 80°00'00"
DATE COMPLETED	12-19-82	12-31-82	2-25-83	12-17-82	12-13-82	11-10-82	12-8-82	10-4-82	1-20-83	12-15-82
ELEVATION	1425 GR	1340 GR	1390 GR	680 GR	1430 GR	1385 GR	1410 GR	1115 GR	1400 GR	1360 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC: 2300-4050 CNL: 2300-4039 GD: 3700-4050			GR/DBC: 500-4050	DBC: 398-4270 DLL: 398-4271				GR/DBC: 2100-4100 DLL: 1998-4100 T: 2089-4100 Laser: 3810-4004	GR/DBC: 2350-4085 T: 2350-4086 IL: 2350-4081
TULLY	2416-	2084-	2158-	1253-	2556-	2444-	2485-	1936-	2437-	2408-
ONONDAGA LIMESTONE CHERT	2628-	2311-	2396-	1454-	2783-	2660-	2702-	2130-	2654-	2630-
ORISKANY	2894-			Absent	3052-		2960-	2402-	Absent	Absent
HELDERBERG KEYSER-BASS ISLANDS	2916-			1734- 1774-	3062- 3102-		2974-	2410-	2916- 2946-	2888- 2910-
SALINA GUELPH-LOCKPORT	2958- 3460-	2650- 3030-	2696- 2926-	1830- 2226-	3132 3634-		3026-	2533- 3000-	2992- 3470-	2970- 3436-
CLINTON IRONDEQUOIT	3724- 3788-	3350-	3416-	2488- 2538-	3908- 3970-	3900-	3836- 3896-	3274- 3326-	3747- 3794-	3704- 3758-
MEDINA GRIMSBY WHIRLPOOL	3834- 3869- 3976-	3366- 3514-	3436- 3584-	2576- 2584- 2726-	4016-4124 4174-	3922- 4030-	3928- 4096-	3368- 3506-	3850- 3857- 3994-	3812- 3824- 3998-
QUEENSTON	3991-	3530-	3598-	2738-	4182-	4045-	4104-	3531-	4002-	3964-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3841-3902	3397-3530	3482-3596	2582-2746	4040-4122	3903-3977	3976-4101	3377-3528	3861-3915	3825-3871
TOTAL DEPTH	4052	3602	3675	2800	4283	4172	4210	3622	4104	4086
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,500 Mcf AF 1,100 psi/48 hrs. development Edinboro North field	50 Mcf AF 500 psi/12 hrs. development Hornby pool North East field	1,600 Mcf AF 1,200 psi/72 hrs. development Hornby pool North East field	1,200 Mcf AF 860 psi/240 hrs. development Charter Oaks pool Erie field	2,300 Mcf AF 1,180 psi/72 hrs. development Edinboro North field	2,200 Mcf AF 1,140 psi/168 hrs. development Swails pool Orumlin field	2,000 Mcf AF 1,180 psi/72 hrs. development Mill Village field	1,000 Mcf AF 963 psi/240 hrs. development Lundys Lane pool Conneaut field	1,750 Mcf AF 1,150 psi/4 hrs. development Swails pool Orumlin field	84 Mcf Nat. 2,144 Mcf AF 1,175 psi/4 hrs. development Swails pool Orumlin field

COUNTY Permit Number	Erie 22458	Erie 22459	Erie 22460	Erie 22464	Erie 22471	Erie 22472	Erie 22473	Erie 22474	Erie 22475	Erie 22476
NAME OF WELL	Clifford & Hazel Brown #1	Elegeer #1	Paul & Silva Skelton #2	Joseph & Mildred Mejerik #1	Ray & Ruth Selmon #2	Millard Cherry #1	Herbert J. Cherry #1	H. Oberlander #1	Ray & Ruth Selmon #3	Ray & Ruth Selmon #4
OPERATOR	NRM Petroleum Corporation	Vineyard Oil & Gas Company	N.E.A. Cross Company	N.E.A. Cross Company	NRM Petroleum Corporation	Northwest Natural Gas Company	Northwest Natural Gas Company	Vineyard Oil & Gas Company	NRM Petroleum Corporation	NRM Petroleum Corporation
TOWNSHIP	LeBoeuf	Waterford	Waterford	Waterford	Waterford	Conneaut	Conneaut	Waterford	Waterford	Waterford
QUADRANGLE	Miller's Station	Cambridge Spg., NE	Waterford	Waterford	Waterford	Conneautville	Beaver Center	Cambridge Spg., NE	Cambridge Spg., NE	Waterford
LATITUDE	4,500 ft. S 41°52'30"	12,900 ft. S 41°57'30"	8,200 ft. S 41°57'30"	4,500 ft. S 41°57'30"	13,240 ft. S 41°57'30"	6,800 ft. S 41°52'30"	5,600 ft. S 41°52'30"	7,000 ft. S 41°57'30"	14,230 ft. S 41°57'30"	14,610 ft. S 41°57'30"
LONGITUDE	9,250 ft. W 79°52'30"	5,950 ft. W 80°02'30"	5,950 ft. W 79°57'30"	8,850 ft. W 79°57'30"	10,380 ft. W 79°57'30"	11,000 ft. W 80°20'00"	550 ft. W 80°22'30"	10,200 ft. W 80°00'00"	190 ft. W 80°00'00"	9,660 ft. W 79°57'30"
DATE COMPLETED	1-21-83	12-22-82	1-26-83	1-17-83	12-1-82	11-27-82	12-5-82	12-10-82	1-27-83	12-7-82
ELEVATION	1605 GR	1485 GR	1180 GR	1185 GR	1370 GR	1045 GR	1015 GR	1440 GR	1410 GR	1385 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC: 2850-4635 IL: 2850-4631	GR/DBC: 372-4232 IL: 397-4228	GR/DBC: 2050-3786 GO: 3500-3786	GR/DBC: 2000-3793 LL: 3090-3790	GR/DBC: 2400-4130 IL: 2400-4124			GR/DBC: 396-4104 IL: 396-4105	GR/DBC: 2450-4214 T: 2450-4216 IL: 2450-4209	GR/DBC: 2400-4194 T: 2400-4195 IL: 2400-4188
TULLY	2886-	2554-	2080-	2060-	2424-	2016-	1965-	2456-	2476-	2446-
ONONDAGA LIMESTONE CHERT	3114-	2768-	2302-	2282-	2642-	2194-	2138-	2674-	2695-	2663-
ORISKANY	Absent	3032-	2570-	2548-	Absent			2930-	Absent	Absent
HELDERBERG KEYSER-BASS ISLANDS	3334- 3356-	3050- 3062-	2586- 2606-	2574- 2596-	2898- 2917-	2440-	2386-	2936- 2972-	2956- 2966-	2920- 2944-
SALINA GUELPH-LOCKPORT	3398- 3972-	3095- 3604-	2678- 3208-	2676- 3188-	2982- 3536-	2500- 3018-	2462- 3006-	3008 3500-	3030- 3578-	3002- 3546-
CLINTON IRONDEQUOIT	4255- 4296-	3864- 3926-	3482- 3534-	3448- 3500-	3794- 3846-	3282-	3225-	3762- 3822-	3833- 3884-	3808- 3860-
MEDINA GRIMSBY WHIRLPOOL	4336- 4358- 4496-	3972-4046 4123-	3570- 3598- 3728-	3548- 3563- 3696-	3896- 3912- 4042-	3384-	3346-	3866-3956 4027-	3940- 3942- 4084-	3908- 3918- 4056-
QUEENSTON	4510-	4132-	3740-	3705-	4051-	3565-	3530-	4024-	4094-	4067-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4394-4449	3978-4129	3618-3675	3634-3564	3921-3978	3412-3470	3374-3439	3879-3939	3974-4030	3930-3996
TOTAL DEPTH	4636	4235	3790	3794	4131	3630	3606	4155	4216	4195
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	335 Mcf AF 900 psi/4 hrs. development New Ireland field	1,700 Mcf AF 1,015 psi/72 hrs. development Edinboro North field	4,000 Mcf AF 1,140 psi/48 hrs. development Waterford pool LeBoeuf field	200 Mcf AF 980 psi/48 hrs. development Swells pool Drumlin field	3,217 Mcf AF 1,000 psi/96 hrs. development Swells pool Drumlin field	970 Mcf AF 990 psi/48 hrs. development Lundys Lane pool Conneaut field	970 Mcf AF 980 psi/48 hrs. development Lundys Lane pool Conneaut field	700 Mcf AF 990 psi/72 hrs. development Edinboro North field	12,216 Mcf AF 1,000 psi/4 hrs. development Swells pool Drumlin field	5,537 Mcf AF 1,150 psi/4 hrs. development Swells pool Drumlin field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 22477	Erie 22478	Erie 22484	Erie 22485	Erie 22486	Erie 22496	Erie 22520	Erie 22522	Erie 22523	Erie 22526
NAME OF WELL	Ray & Ruth Salmon #5	Jack Zimmerly #6	Henry & Ruth Loper #1	Henry & Ruth Loper #2	Ebert Beeman #1	Ray J. & Ruth H. Salmon #6	David Bensink #2	William R. Grafius #1	Samuel & Beverly Hazen #1	Anthony & Virginia Falkowski #2
OPERATOR	NRM Petroleum Corporation	Vineyard Oil & Gas Company	NRM Petroleum Corporation	NRM Petroleum Corporation	Mitch-Well Energy, Incorporated	NRM Petroleum Corporation	U. S. Energy Development Corp.	Mitch-Well Energy, Incorporated	N.E.A. Cross Company	Mitch-Well Energy, Incorporated
TOWNSHIP	Waterford	Waterford	Waterford	Waterford	Waterford	Waterford	Venango	Waterford	Waterford	Washington
QUADRANGLE	Cambridge Spg., NE	Cambridge Spg., NE	Cambridge Spg., NE	Cambridge Spg., NE	Cambridge Spg., NE	Cambridge Spg., NE	Wattsburg	Waterford	Waterford	Cambridge Spg., NE
LATITUDE	490 ft. S 41°55'00"	11,750 ft. S 41°57'30"	8,800 ft. S 41°57'30"	7,440 ft. S 41°57'30"	9,300 ft. S 41°57'30"	12,410 ft. S 41°57'30"	7,910 ft. S 42°02'30"	6,000 ft. S 41°57'30"	8,250 ft. S 42°00'00"	12,650 ft. S 41°57'30"
LONGITUDE	260 ft. W 80°00'00"	7,650 ft. W 80°00'00"	3,460 ft. W 80°00'00"	4,150 ft. W 80°00'00"	1,900 ft. W 80°00'00"	4,110 ft. W 80°00'00"	4,280 ft. W 79°45'00"	3,800 ft. W 79°55'00"	8,500 ft. W 79°57'30"	2,800 ft. W 80°05'00"
DATE COMPLETED	1-26-83	12-16-82	1-4-83	2-1-83	1-6-83	2-3-83	3-8-83	1-17-83	1-9-83	12-30-82
ELEVATION	1395 GR	1475 GR	1330 GR	1285 GR	1295 GR	1397 GR	1348 GR	1400 GR	1230 GR	1450 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC: 2450-4205 IL: 2450-4202	GR/DBC: 398-4228 IL: 398-4229	GR/DBC: 2600-4074 IL: 2600-4075	GR/DBC: 2300-4010 IL: 2500-4008	GR/DBC: 2450-4024 PCL: 3650-3988	GR/DBC: 2425-4162 LL: 2425-4154 PCL: 3900-3669	FDC/SNL: 403-3978 DLL: 403-3978 Laser: 3650-3890	GR/DBC: 2550-4080 CNL: 2550-4069 GD: 3400-4050	GR/DBC: 2000-3762 GD: 3430-3762	GR/DBC: 2400-4124 GD: 2400-4124 CNL: 2400-4113
TULLY	2478-	2528-		2346-		2456-	2266-		2038-	2448-
ONONDAGA LIMESTONE CHERT	2694-	2748-	2645-	2567-	2572-	2672-	2500-	2620-	2263-	2662-
ORISKANY	Absent	Absent	Absent	Absent		2904-	Absent	Absent	2526-	Absent
HELDERBERG KEYSER-BASS ISLANDS	2952- 2974-	3008- 3048-	2920- 2945-	2826- 2850-	2812-	2933- 2946-	2720-	2886- 2908-	2544- 2572-	2936- 2952-
SALINA GUELPH-LOCKPORT	3024- 3558-	3079- 3560-	3002- 3432-	2924- 3372-	2883- 3369-	3011- 3526-	2768- 3350-	2948- 3492-	2636- 3188-	2998- 3500-
CLINTON IRONDEQUOIT	3826- 3880-	3850- 3904-	3704- 3750-	3642- 3690-	3666- 3732-	3810- 3848-	3610- 3666-	3760- 3810-	3418- 3472-	3768- 3825-
MEDINA GRIMSBY WHIRLPOOL	3932- 3936- 4076-	3951-4054 4102-	3802- 3816- 3950-	3741- 3750- 3888-	3778-3850 3926-3935	3902- 3909- 4046-	3696- 3850-	3852- 3875- 4008-	3523- 3525- 3664-	3876- 3886- 4020-
QUEENSTON	4086-	4112-	3960-	3899-	3935-	4055-	3864-	4017-	3675-	4030-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3955-4018	3970-4106	3818-3872	3753-3811	3799-3920	3914-3983	3753-3856	3880-3959	3555-3606	3898-3966
TOTAL DEPTH	4206	4240	4068	4012	4034	4162	3975	4080	3764	4122
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	11,718 Mcf AF 1,000 psi/4 hrs. development Swails pool Drumlin field	1,100 Mcf AF 1,090 psi/24 hrs. development Swails pool Drumlin field	6,639 Mcf AF 1,150 psi/4 hrs. development Swails pool Drumlin field	2,398 Mcf AF 1,150 psi/4 hrs. development Swails pool Drumlin field	3,850 Mcf AF 1,125 psi/4 hrs. development Swails pool Drumlin field	7,060 Mcf AF 1,050 psi/4 hrs. development Swails pool Drumlin	362 Mcf AF 1,100 psi/24 hrs. development Carter Hill field	2,000 Mcf AF 1,125 psi/48 hrs. development Waterford pool LeBoeuf	3,000 Mcf AF 1,130 psi/48 hrs. development Talcott pool Erie	500 Mcf Nat. 1,500 Mcf AF 1,100 psi/48 hrs. development Edinboro North field

COUNTY Permit Number	Erie 22530	Erie 22531	Erie 22532	Erie 22550	Erie 22556	Erie 22557	Erie 22575	Erie 22579	Erie 22584	Erie 22595
NAME OF WELL	H. Mikovob #3	H. Mikovoh #7	L. Sherman #2	Kurtz & Barbara Plohthorn #3	Violet More #1	Eugene Wright #1	Gray #1	L. Sherman #1	J. Salmon #1	Francis Gates #1
OPERATOR	Envirogas, Incorporated	Envirogas, Incorporated	Envirogas, Incorporated	N.E.A. Cross Company	U. S. Energy Development Corp.	Doran & Associates, Incorporated	Vineyard Oil & Gas Company	Envirogas, Incorporated	Vineyard Oil & Gas Company	LeBoeuf Energy, Incorporated
TOWNSHIP	Elk Creek	Elk Creek	Elk Creek	LeBoeuf	Venango	LeBoeuf	Waterford	Elk Creek	Millcreek	LeBoeuf
QUADRANGLE	Albion	Albion	Albion	Cambridge Spg., NE	Wattsburg	Cambridge Spg., NE	Cambridge Spg., NE	Albion	Erie South	Cambridge Spg., NE
LATITUDE	4,050 ft. S 41°55'00"	8,250 ft. S 41°55'00"	2,650 ft. S 41°55'00"	3,550 ft. S 41°55'00"	9,250 ft. S 42°02'30"	12,950 ft. S 41°55'00"	9,150 ft. S 41°57'30"	4,400 ft. S 41°52'30"	5,100 ft. S 42°05'00"	4,000 ft. S 41°55'00"
LONGITUDE	4,900 ft. W 80°15'00"	5,000 ft. W 80°15'00"	8,950 ft. W 80°15'00"	7,400 ft. W 80°00'00"	10,450 ft. W 79°45'00"	6,450 ft. W 80°00'00"	1,650 ft. W 80°02'30"	9,450 ft. W 80°15'00"	4,250 ft. W 80°02'30"	6,800 ft. W 80°00'00"
DATE COMPLETED	1-18-83	12-17-82	1-5-83	2-8-83	2-27-83	3-8-83	1-10-83	1-12-83	1-4-83	2-16-83
ELEVATION	1155 GR	1190 GR	1120 GR	1540 GR	1330 GR	1560 GR	1530 GR	1125 GR	1020 GR	1540 GR
LOGS RECEIVED AND LOGGED INTERVALS				GR/OBC: 2550-4326 CNL: 2550-4326	FDC/SNL: 444-3908 DLL: 444-3905 Laser: 3640-3875	GR: 0-4444 CNL/OBC: 2600-4444 PCL: 3400-4438 DLL: 2600-4440	GR/OBC: 400-4236 CNL: 400-4236 IL: 2150-4232			
TULLY	2022-	2077-	1970-	2608-	2290-	2700-	2581-	1975-		2625-
ONONDAGA LIMESTONE CHERT	2219-	2270-	2167-	2826-	2528-	2920-	2799-	2167-	1388-	2843-
ORISKANY	2498-	2538-	2431-	Absent	Absent	Absent	Absent	2435-	Absent	3105?
HELDERBERG KEYSER-BASS ISLANDS	2505-	2550-	2444-	3084- 3108-	2704-	3166- 3196-	3060- 3094-	2446-	2016-	3128?
SALINA GUELPH-LOCKPORT	2623- 3106-	2658- 3166-	2549- 3056-	3150- 3722-	2804- 3340-	3232- 3768-	3130- 3628-	2557- 3062-	2122- 2638-	3174- 3710-
CLINTON IRONDEQUOIT	3351- 3405-	3398- 3464-	3304- 3355-	3967- 4024-	3608- 3662-	4024- 4106-	3908- 3946-	3316- 3359-	2786- 2990-	3986-
MEDINA GRIMSBY WHIRLPOOL	3445- 3580-	3510- 3640-	3401- 3530-	4056- 4088- 4222-	3694- 3847-	4162- 4168- 4306-	3988- 4000- 4140-	3398- 3534-	3004- 3151-	4075- 4243-
QUEENSTON	3610-	3668-	3558-	4230-	3860-	4316-	4150-	3561-	3159-	4250-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3476-3605	3515-3664	3406-3555	4092-4146	3737-3857	4180-4246	4009-4148	3442-3448	3019-3157	4113-4170
TOTAL DEPTH	3693	3737	3662	4326	3960	4444	4238	3672	3255	4340
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	900 Mcf AF 860 psi/240 hrs. development Pageville Pool pool Conneaut field	900 Mcf AF 1,115 psi/240 hrs. development Pageville Pool pool Conneaut field	90 Mcf AF 865 psi/240 hrs. development Lundys Lane pool Conneaut field	4,600 Mcf AF 890 psi/48 hrs. development Mill Village field	416 Mcf AF 900 psi/24 hrs. development Carter Hill field	50 Mcf AF 1,150 psi/72 hrs. development Mill Village field	1,000 Mcf AF 1,025 psi/120 hrs. development Swalls pool Orumlin field	200 Mcf AF 910 psi/240 hrs. development Lundys Lane pool Conneaut field	IP not given 800 psi/72 hrs. extension Glenwood pool Erie field	1,411 Mcf AF 880 psi/72 hrs. development Mill Village field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 22596	Erie 22611	Erie 22612	Erie 22613	Erie 22618	Erie 22628	Erie 22629	Erie 22636	Erie 22640	Erie 22641
NAME OF WELL	Winfield McGahan #1	Timothy Sexton #1	Joseph Stubenhofer #1	Clifford Troyer #1	Herman Zielinski #2	Harding #1	Belt #1	George & Mildred Rieder #1	John Rubay #1	Lloyd Schwab #2
OPERATOR	LeBoeuf Energy, Incorporated	NRM Petroleum Corporation	NRM Petroleum Company	NRM Petroleum Corporation	NRM Petroleum Corporation	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	N.E.A. Cross Company	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.
TOWNSHIP	LeBoeuf	Green	Greene	Green	Waterford	Waterford	LeBoeuf	Waterford	Venango	Venango
QUADRANGLE	Cambridge Spg., NE	Hammett	Hammett	Hammett	Waterford	Cambridge Spg., NE	Cambridge Spg., NE	Waterford	Wattsburg	Wattsburg
LATITUDE	2,950 ft. S 41°55'00"	13,300 ft. S 42°07'30"	13,780 ft. S 42°07'30"	13,370 ft. S 42°02'30"	14,620 ft. S 42°00'00"	11,500 ft. S 41°57'30"	11,250 ft. S 41°55'00"	4,100 ft. S 41°57'30"	3,750 ft. S 42°05'00"	14,390 ft. S 42°07'30"
LONGITUDE	4,250 ft. W 80°00'00"	11,090 ft. W 79°55'00"	9,400 ft. W 79°52'30"	4,470 ft. W 79°57'30"	5,100 ft. W 79°57'30"	7,050 ft. W 80°02'30"	5,750 ft. W 80°00'00"	10,250 ft. W 79°55'00"	10,500 ft. W 79°50'00"	5,190 ft. W 79°47'30"
DATE COMPLETED	2-12-83	2-12-83	3-19-83	3-13-83	2-26-83	1-20-83	2-5-83	2-14-83	2-3-83	1-26-83
ELEVATION	1390 GR	1375 GR	1295 GR	1232 GR	1200 GR	1500 GR	1510 GR	1310 GR	1370 GR	1540 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC: 2450-4216 GD: 3600-4150 PCL: 3800-4092	GR/DBC: 2000-3720 IL: 2000-3723	GR/DBC: 1950-3622 T: 1950-3623 IL: 1950-3619 CCL: 3359-3426	GR/DBC: 2000-3726 IL: 2000-3723 PCL: 3473-3537	GR/DBC: 3100-3814	GR/DBC: 405-4179	GR/DLL: 315-4314	GR/DBC: 2400-3978 GD: 3650-3950		
TULLY	2492-	2090-	2012-	2004-		2520-	2654-		2171-	2270-
ONONDAGA LIMESTONE CHERT	2711-	2318-	2236-	2232-		2734-	2878-	2456-	2400-	2494-
ORISKANY	Absent	Absent	2496-	2484-		Absent	Absent	2708-		
HELDERBERG KEYSER-BASS ISLANDS	2974- 2992-	2590- 2618-	2504- 2532-	2506- 2524-		2996- 3020-	3118- 3138-	2730- 2746-		
SALINA GUELPH-LOCKPORT	3038- 3590-	2672- 3082-	2586- 2996-	2586- 3092-	3192-	3064- 3550-	3182- 3730-	2816- 3360-	2722- 2946-	2800- 3196-
CLINTON IRONDEQUOIT	3862- 3914-	3348- 3391-	3244- 3300-	3360- 3404-	3450- 3497-	3837- 3884-	4012- 4068-	3614- 3674-	3436-	3536-
MEDINA GRIMSBY WHIRLPOOL	3956- 3982- 4110-	3446- 3451- 3577-	3346- 3356- 3478-	3450- 3473- 3596-	3546- 3562- 3694-	3938- 3956- 4084-	4112- 4136- 4265-	3728- 3748- 3867-	3452- 3609-	3551- 3706-
QUEENSTON	4119-	3590-	3496-	3606-	3703-	4092-	4276-	3880-	3619-	3722-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3800-4092	3454-3513	3361-3428	3473-3537	3594-3640	3958-4089	4141-4271	3750-3808	3526-3617	3605-3712
TOTAL DEPTH	4220	3727	3623	3727	3815	4181	4314	3982	3680	3795
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	932 Mcf AF 1,100 psi/72 hrs. development Mill Village field	84 Mcf Nat. 133 Mcf AF 850 psi/4 hrs. development Kuhl pool North East	270 Mcf AF 825 psi/96 hrs. development Hornby pool North East	2,316 Mcf AF 1,075 psi/4 hrs. extension Goddard pool Erie	84 Mcf Nat. 2,316 Mcf AF 1,100 psi/4 hrs. development Waterford pool LeBoeuf	750 Mcf AF 1,010 psi/48 hrs. development Edinboro North field	2,500 Mcf AF 1,200 psi/120 hrs. development Mill Village field	3,100 Mcf AF 1,160 psi/48 hrs. development Waterford pool LeBoeuf	1,500 Mcf AF 1,200 psi/48 hrs. development Hornby pool North East	100 Mcf AF 800 psi/72 hrs. development Little Hope pool North East

COUNTY Permit Number	Erie 22643	Erie 22654	Erie 22658	Erie 22659	Erie 22660	Erie 22661	Erie 22662	Erie 22663	Erie 22680	Erie 22681
NAME OF WELL	Carl Little #1	Gerald Beck #1	Robert and Imogene Harrison #3	O'Connell #2	Abram J. Thomas #1	Walter & Eleanor Geber #1	Silas Coon #2	John & Mildred Gocel #1	Loma Fuller #1	George Lenart #1
OPERATOR	Beltsee Oil Company, Inc.	Mitch-Well Energy, Incorporated	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	D.W. & E. Associates	N.E.A. Cross Company
TOWNSHIP	Venango	Waterford	Waterford	Waterford	Waterford	Waterford	LeBoeuf	LeBoeuf	Waterford	Waterford
QUADRANGLE	Wattsburg	Cambridge Spg., NE	Cambridge Spg., NE	Waterford	Cambridge Spg., NE	Cambridge Spg., NE	Waterford	Miller's Station	Waterford	Waterford
LATITUDE	3,830 ft. S 42°05'00"	, 8,700 ft. S 41°57'30"	300 ft. S 41°55'00"	10,800 ft. S 42°00'00"	10,950 ft. S 42°00'00"	14,900 ft. S 42°00'00"	3,100 ft. S 41°55'00"	7,400 ft. S 41°52'30"	14,800 ft. S 42°00'00"	13,300 ft. S 42°00'00"
LONGITUDE	890 ft. W 79°50'00"	5,150 ft. W 80°02'30"	6,850 ft. W 80°00'00"	3,350 ft. W 79°55'00"	5,200 ft. W 80°00'00"	7,700 ft. W 80°00'00"	10,900 ft. W 79°57'30"	6,050 ft. W 79°55'00"	10,000 ft. W 79°55'00"	5,000 ft. W 79°55'00"
DATE COMPLETED	2-13-83	2-10-83	7-29-83	6-13-83	2-19-83	2-26-83	2-13-83	3-5-83	2-17-83	6-19-83
ELEVATION	1345 GR	1575 GR	1490 GR	1520 GR	1320 GR	1250 GR	1235 GR	1510 GR	1370 GR	1460 GR
LOGS RECEIVED AND LOGGED INTERVALS		GR/FDC: 800-4210	FDC/SNL: 2251-4264	FDC/SNL: 250-4154	GR/DBC: 2100-3838	GR/CNL/FDC: 2000-3894	DBC: 3400-4190	GR/DBC: 2700-4510 GO: 4200-4460	GR/DBC: 2200-4018 CNL: 2200-4020	FDC/SNL: 2103-4116
TULLY	2148-	2595-	2560-	2401-	2130-	2158-	2472-	2804-	2260-	2358-
ONONDAGA LIMESTONE CHERT	2381-	2813-	2780-	2634-	2350-	2380-	2688-	3030-	2482-	2592-
ORISKANY		Absent	Absent	Absent	Absent	Absent	Absent	3250-	2742-	Absent
HELDERBERG KEYSER-BASS ISLANDS		3073-	3038-	2888-	2650- 2674-	2718- 2760-	2942- 2968-	3266-	2768- 2786-	2844-
SALINA GUELPH-LOCKPORT	2720- 2940-	3135- 3651-	3067- 3650-	3012- 3516-	2754- 3240-	2816- 3270-	3014- 3534-	3308- 3894-	2850- 3374-	3038- 3476-
CLINTON IRONDEQUOIT	3430-	3909- 3965-	3892- 3944-	3782- 3832-	3500- 3558-	3538- 3596-	3818- 3872-	4149- 4217-	3630- 3680-	3736- 3790-
MEDINA GRIMSBY WHIRLPOOL	3444- 3592-	3997- 4165-	3976- 4146-	3867- 4028-	3600- 3627- 3752-	3626- 3654- 3793-	3916- 3926- 4071-	4278- 4312- 4416-	3736- 3740- 3880-	3824- 3986-
QUEENSTON	3606-	4170-	4152-	4038-	3763-	3801-	4081-	4431-	3894-	3996-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3496-3604	4021-4165	4034-4084	3944-3974	3644-3701	3688-3746	3936-4012	4316-4358	3765-3832	3896-3928
TOTAL DEPTH	3671	4251	4250	4190	3839	3882	4190	4510	4019	4118
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	100 Mcf AF 1,100 psi/48 hrs. development Little Hope pool North East field	3,000 Mcf AF 1,065 psi/48 hrs. development Reeds Corners field	6,000 Mcf AF 950 psi/48 hrs. development Swails pool Drumlin field	1,200 Mcf AF 1,100 psi/48 hrs. development Talcott pool Erie field	2,000 Mcf AF 1,100 psi/48 hrs. extension Swails pool Drumlin field	1,000 Mcf AF 1,100 psi/48 hrs. development Swails pool Drumlin field	6,000 Mcf AF 1,000 psi/48 hrs. development Mill Village field	200 Mcf AF 800 psi/48 hrs. development New Ireland field	2,900 Mcf AF 1,100 psi/48 hrs. development Waterford pool LeBoeuf field	1,300 Mcf AF 1,100 psi/48 hrs development Waterford pool LeBoeuf field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 22682	Erie 22683	Erie 22687	Erie 22688	Erie 22690	Erie 22692	Erie 22701	Erie 22839	Erie 22840	Erie 22841
NAME OF WELL	Paul Benson #1	Paul & Lily Chleba #1	Leo T. Oliver #1	Cynthia Reemsnyder #1	Brewer/Osborn #1	John Hood #1	Katherine Ostryniec #1	Mildred Hanes #1	Kenneth/Mildred Hanes #1	Pauline Hull #1
OPERATOR	N.E.A. Cross Company	Berea Oil & Gas Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company
TOWNSHIP	Waterford	Union	LeBoeuf	Waterford	Waterford	Waterford	Waterford	LeBoeuf	LeBoeuf	Waterford
QUADRANGLE	Waterford	Union City	Waterford	Waterford	Waterford	Waterford	Cambridge Spg., NE	Cambridge Spg., NE	Cambridge Spg., NE	Waterford
LATITUDE	12,300 ft. S 42°00'00"	10,860 ft. S 41°57'30"	10,750 ft. S 42°00'00"	3,250 ft. S 41°57'30"	8,900 ft. S 42°00'00"	9,350 ft. S 42°00'00"	12,850 ft. S 41°57'30"	11,550 ft. S 41°50'00"	12,000 ft. S 41°55'00"	550 ft. S 41°55'00"
LONGITUDE	2,800 ft. W 79°57'30"	7,710 ft. W 79°47'30"	9,150 ft. W 79°57'30"	11,150 ft. W 79°57'30"	10,600 ft. W 79°55'00"	8,600 ft. W 79°55'00"	5,900 ft. W 80°00'00"	3,800 ft. W 80°00'00"	3,250 ft. W 80°00'00"	9,600 ft. W 79°57'30"
DATE COMPLETED	7-14-83	6-28-83	8-13-83	4-5-83	6-28-83	8-4-83	5-7-83	5-27-83	4-19-83	5-1-83
ELEVATION	1235 GR	1408 GR	1250 GR	1210 GR	1330 GR	1340 GR	1380 GR	1380 GR	1365 GR	1360 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/FDC: 2085-3825	GR/FDC: 0-4289 LL: 640-4284 PCL: 3800-4222	FDC/SNL: 1730-3728	GR/FDC: 2000-3798	GR/DBC: 1900-3911	SNL/DBC: 1959-3963	GR/DBC: 2135-4134	SNL/DBC: 2150-4162		GR/DBC: 2155-4157
TULLY	2095-	2558-	2036-	2080-	2178-	2244-	2438-	2541-	2524-	2432-
ONONDAGA LIMESTONE CHERT	2350-	2797-	2260-	2304-	2400-	2474-	2654-	2760-	2754-	2650-
ORISKANY	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent		Absent
HELDERBERG KEYSER-BASS ISLANDS	2570-	3008-	2522-	2580-	2654-	2720-	2916- 2932-	3009-		2918-
SALINA GUELPH-LOCKPORT	2650- 3206-	3058- 3648-	2588- 3156-	2650- 3180-	2726- 3288-	2754- 3335-	2988- 3514-	3186- 3606-		3096- 3516-
CLINTON IRONDEQUOIT	3460- 3516-	3922- 3967-	3415- 3472-	3442- 3494-	3536- 3592-	3592- 3644-	3768- 3823-	3888- 3942-	3936-	3784- 3834-
MEDINA GRIMSBY WHIRLPOOL	3546- 3712-	4010- 4164-	3504- 3668-	3528- 3690-	3626- 3786-	3666- 3838-	3877- 3886- 4014-	3966- 4142-	3970- 4136-	3860- 4034-
QUEENSTON	3722-	4178-	3674-	3704-	3796-	3847-	4032-	4152-	4146-	4045-
PRODUCING FORMATION	Medina	Medina/Whirlpool	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3599-3647	4038-4171	3554-3610	3610-3642	3684-3715	3735-3755	3978-4105	4034-4054	4031-4057	3915-3977
TOTAL DEPTH	3833	4294	3738	3800	3900	3957	4143	4162	4240	4175
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,000 Mcf AF 1,050 psi/48 hrs. development Talcott pool Erie	1,200 Mcf AF 1,200 psi/72 hrs. development Emmons pool Union City	1,000 Mcf AF 1,100 psi/48 hrs, development Talcott pool Erie	500 Mcf AF 1,000 psi/48 hrs. development Swails pool Drumlin	1,100 Mcf AF 1,100 psi/48 hrs. development Talcott pool Erie	3,900 Mcf AF 1,100 psi/48 hrs. development Talcott pool Erie	2,000 Mcf AF 1,000 psi/48 hrs. development Swails pool Drumlin	11,500 Mcf Net. 14,000 Mcf AF 1,000 psi/48 hrs. development Mill Village field	5,000 Mcf AF 1,040 psi/48 hrs, development Mill Village field	2,000 Mcf AF 1,000 psi/48 hrs, development Swails pool Drumlin

COUNTY Permit Number	Erie 22871	Erie 22880	Erie 22881	Erie 22883	Erie 22884	Erie 22915	Erie 22916	Erie 22939	Erie 22964	Erie 22966
NAME OF WELL	Michael Melnick #1	Gordon & George Peters #1	S. Wiater #1	John Simmons #2	J. Hecker #2	Kenneth Brunner #1	Samuel Schweitzer #1	Clyde Peters #1	Laird Orton #1	John Simmons #1
OPERATOR	N.E.A. Cross Company	N.E.A. Cross Company	Meridian Exploration #702	Meridian Exploration #691	Meridian Exploration #688	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	Meridian Exploration #690
TOWNSHIP	LeBoeuf	LeBoeuf	LeBoeuf	Washington	Washington	Waterford	Mill Village	LeBoeuf	LeBoeuf	Washington
QUADRANGLE	Miller's Station	Miller's Station	Cambridge Springs	Edinboro South	Edinboro South	Waterford	Miller's Station	Miller's Station	Cambridge Springs	Edinboro South
LATITUDE	200 ft. S 41°52'30"	6,150 ft. S 41°52'30"	3,650 ft. S 41°52'30"	7,100 ft. S 41°52'30"	3,550 ft. S 41°52'30"	1,950 ft. S 41°57'30"	600 ft. S 41°52'30"	8,300 ft. S 41°52'30"	2,250 ft. S 41°52'30"	7,100 ft. S 41°52'30"
LONGITUDE	1,300 ft. W 79°57'30"	350 ft. W 79°57'30"	8,500 ft. W 80°00'00"	5,700 ft. W 80°07'30"	8,500 ft. W 80°07'30"	9,750 ft. W 79°57'30"	5,050 ft. W 79°57'30"	400 ft. W 79°57'30"	3,850 ft. W 80°00'00"	7,400 ft. W 80°07'30"
DATE COMPLETED	7-21-83	6-5-83	5-15-83	6-20-83	7-16-83	8-18-83	6-18-83	6-11-83	6-25-83	6-26-83
ELEVATION	1250 GR	1470 GR	1435 GR	1390 GR	1390 GR	1270 GR	1210 GR	1525 GR	1470 GR	1430 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC: 2210-4214	GR/DBC: 2740-4468	GR/DBC: 2340-4361 DLL: 395-4357	GR/DBC: 4160-4219	GR/DBC: 2200-4198 IL/DLL: 2203-4199 CBL: 2600-4160	SNL/DBC: 1779-3782	GR/DBC: 2129-4166	GR/DBC: 2550-4536	GR/DBC: 2399-4402 DLL: 395-4357	GR/DBC: 2230-4334
TULLY	2476-	2752-	2622-	2476-	2471-	2105-	2434-	2828-	2652-	2509-
ONONDAGA LIMESTONE CHERT	2700-	2974-	2842-	2696-	2683-	2325-	2656-	3042-	2874-	2706-
ORISKANY	Absent	Absent	3098-	Absent	Absent	Absent	Absent	Absent	Absent	2972-
HELDERBERG KEYSER-BASS ISLANDS	2952-	3186- 3212-	3120- 3123-	2940- 2963-	2938-	2592-	2902- 2918-	3258- 3278-	3128- 3150-	2990- 3006-
SALINA GUELPH-LOCKPORT	3053- 3600-	3255- 3840-	3162- 3730-	3010- 3600-	3049- 3587-	2712- 3231-	2967- 3528-	3322- 3886-	3198- 3764-	3046- 3628-
CLINTON IRONDEQUOIT	3834- 3900-	4100- 4164-	3998- 4051-	3860- 3910-	3840- 3893-	3508- 3556-	3802- 3854-	4156- 4210-	4036- 4090-	3886- 3938-
MEDINA GRIMSBY WHIRLPOOL	3934- 4102-	4202- 4224- 4364-	4106- 4114- 4256-	3964- 3972- 4112-	3935- 4094-	3580- 3754-	3892- 3929- 4051-	4248- 4284- 4413-	4126- 4159- 4290-	3941- 3996- 4138-
QUEENSTON	4113-	4380-	4272-	4124-	4101-	3763-	4064-	4427-	4304-	4150-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4006-4059	4262-4310	4150-4210	3995-4033	3957-4006	3630-3700	3931-3958	4324-4368	4186-4196	4011-4092
TOTAL DEPTH	4215	4475	4379	4221	4188	3785	4180	4538	4400	4236
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	500 Mcf AF 1,000 psi/48 hrs. development Mill Village field	1,300 Mcf AF 1,050 psi/48 hrs. development Mill Village field	400 Mcf AF 1,175 psi/168 hrs. development Edinboro North field	269 Mcf AF 1,200 psi/168 hrs. development Edinboro field	58 Mcf Nat. 130 Mcf AF 1,210 psi/288 hrs. development Edinboro field	2,200 Mcf AF 1,150 psi/48 hrs. development Swells pool Drumlin field	1,000 Mcf AF 1,000 psi/48 hrs. development Mill Village field	500 Mcf AF 1,090 psi/48 hrs. development Mill Village field	5,000 Mcf AF 1,150 psi/48 hrs. development Edinboro North field	53 Mcf Nat. 896 Mcf AF 1,200 psi/168 hrs. development Edinboro field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 22967	Erie 22968	Erie 22984	Erie 23001	Erie 23002	Erie 23003	Erie 23004	Erie 23006	Erie 23010	Erie 23012
NAME OF WELL	Cecil Stewart #1	Cecil Stewart #2	Loesel #1	Roman J. Bem, Jr. #1	Richard W. Blore #1	Stanley A. Krol #2	F. B. Richards #1	Perry B. Davids #1	Jon Rothstein #1	Lowell Salmon #1
OPERATOR	Meridian Exploration #703	Meridian Exploration #704	Vineyard Oil & Gas Company	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	C & C Troyer Brothers #83	N.E.A. Cross Company
TOWNSHIP	Washington	Washington	Waterford	Amity	Amity	Amity	Amity	Amity	Waterford	LeBoeuf
QUADRANGLE	Cambridge Spg., NE	Cambridge Spg., NE	Cambridge Spg., NE	Union City	Union City	Union City	Union City	Union City	Waterford	Cambridge Spg., NE
LATITUDE	1,000 ft. S 41°55'00"	3,000 ft. S 41°55'00"	9,650 ft. S 41°57'30"	5,240 ft. S 41°57'30"	1,140 ft. S 41°57'30"	12,460 ft. S 42°00'00"	13,520 ft. S 42°00'00"	14,850 ft. S 42°00'00"	14,700 ft. S 41°57'30"	12,950 ft. S 41°55'00"
LONGITUDE	10,750 ft. W 80°00'00"	11,100 ft. W 80°00'00"	2,900 ft. W 80°00'00"	3,780 ft. W 79°50'00"	5,000 ft. W 79°50'00"	9,600 ft. W 79°50'00"	5,000 ft. W 79°50'00"	3,475 ft. W 79°50'00"	6,600 ft. W 79°57'30"	5,850 ft. W 80°00'00"
DATE COMPLETED	5-28-83	5-21-83	8-6-83	7-25-83	7-18-83	7-9-83	7-25-83	7-22-83	6-25-83	7-28-83
ELEVATION	1430 GR	1550 GR	1600 GR	1530 GR	1485 GR	1410 GR	1365 GR	1311 GR	1170 GR	1590 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/OBC: 2250-4256	GR/DBC: 2283-4286 OLL: 2280-4274				CNL/OBC: 2350-4129 GR/IL: 2330-4122 3-0 VEL: 2600-4050 STRATA: 3830-4060	CNL/DBC: 2375-4128 GR/IL: 2375-4118 CBL/PCL: 2400-4078	CNL/OBC: 2320-4077 GR/IL: 2320-4067 3-0 VEL: 2550-4046 STRATA: 3830-4000		GR/DBC/CNL: 2444-4485
TULLY	2556-	2637-	2373-	2594-	2510-	2418-	2388-	2346-	2250-	2752-
ONONDAGA LIMESTONE CHERT	2774-	2856-	2699-	2832-	2752-	2650-	2622-	2580-	2466-	2974-
ORISKANY	Absent	Absent			2926-	Absent	Absent	Absent	2735-	Absent
HELDERBERG KEYSER-BASS ISLANDS	3042- 3059-	3128- 3148-	2951-	3002-		2888-	2852-	2802-	2750-	3221-
SALINA GUELPH-LOCKPORT	3110- 3624-	3195- 3686-	3167- 3683-	3178- 3696-	3158- 3596-	2922- 3504-	2927- 3508-	2883- 3450-		3324- 3852-
CLINTON IRONDEQUOIT	3894- 3946-	3936- 3988-	3891- 4031-	3898- 4016-	3796- 3914-	3758- 3818-	3748- 3802-	3704- 3764-	3662-	4110- 4164-
MEDINA GRIMSBY WHIRLPOOL	3980- 4000- 4140-	4042- 4044- 4186-	4043- 4190-	4057- 4206-	3972- 4104-	3852- 4000-	3840- 3988-	3804- 3957-	3672- 3860-	4208- 4364-
QUEENSTON	4153-	4196-	4196-	4220-,	4116-	4024-	4005-	3970-	3868-	4372-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4012-4077	4078-4138	4044-4195	4086-4140	4002-4070	3878-4014	3858-3932	3834-3914	3755-3811	4263-4314
TOTAL DEPTH	4257	4288	4280	4330	4238	4150	4130	4090	3973	4473
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS ·	175 Mcf AF 1,150 psi/168 hrs. development Edinboro North	50 Mcf Net. 600 Mcf AF 1,130 psi/288 hrs. development	1,570 Mcf AF 1,050 psi/96 hrs, development Swails	750 Mcf AF 1,150 psi/24 hrs. development Waterford	600 Mcf AF 1,150 psi/24 hrs. development Alder Run	450 Mcf AF 1,150 psi/24 hrs. development Waterford	300 Mcf AF 1,100 psi/24 hrs. development Alder Run	800 Mcf AF 1,100 psi/24 hrs. development Alder Run	1,800 Mcf AF 1,150 psi/? hrs. development Waterford	2,100 Mcf AF 1,180 psi/48 hrs. development Mill Village

COUNTY Permit Number	Erie 23013	Erie 23036	Erie 23037	Erie 23038	Erie 23040	Erie 23041	Erie 23042	Erie 23044	Erie 23045	Erie 23066
NAME OF WELL	William Kovschek #1	William Czarnecki #1	Robert B. Davis #1	Robert B. Davis #2	James J. Gregor #1	Stanley A. Krol #1	Lyle Lozier #1	Sadie Morvey, et al #2	Frank Jones #1	A. E. Hakkarainen #1
OPERATOR	N.E.A. Cross Company	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	N.E.A. Cross Company
TOWNSHIP	LeBoeuf	Amity	Amity	Amity	Amity	Amity	Amity	Amity	Union	Waterford
QUADRANGLE	Cambridge Spg., NE	Union City	Union City	Union City	Union City	Union City	Union City	Union City	Union City	Cambridge Spgs., N.E.
LATITUDE	14,200 ft. S 41°55'00"	6,640 ft. S 41°57'30"	11,760 ft. S 42°00'00"	11,220 ft. S 42°00'00"	4,600 ft. S 41°57'30"	13,250 ft. S 42°00'00"	6,600 ft. S 41°57'30"	1,040 ft. S 41°57'30"	10,140 ft. S 41°57'30"	100 ft. S 41°57'30"
LONGITUDE	6,350 ft. W 80°00'00"	3,160 ft. W 79°50'00"	6,120 ft. W 79°50'00"	7,320 ft. W 79°50'00"	2,540 ft. W 79°50'00"	8,300 ft. W 79°50'00"	1,750 ft. W 79°50'00"	10,880 ft. W 79°47'30"	10,800 ft. W 79°47'30"	4,650 ft. W 80°00'00"
DATE COMPLETED	7-10-83	8-4-83	8-11-83	7-30-83	8-15-83	7-13-83	7-4-83	8-18-83	6-29-83	8-5-83
ELEVATION	1550 GR	1515 GR	1280 GR	1325 GR	1520 GR	1360 GR	1570 GR	1300 GR	1634 GR	1230 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/OBC: 2447-4453		SNL/OBC: 1994-3996 LL/GR/IL: 1989-3996 Laser: 3885-3894 3-D VEL: 2500-3946	CNL/OBC: 2300-4049 GR/IL: 2300-4042 3-D VEL: 2700-3968 STRATA. 3750-4001						GR/OBC: 2060-3797
TULLY	2723-	2608-	2302-	2336-	2590-	2370-	2644-	2362-	2768-	2073-
ONONDAGA LIMESTONE CHERT	2944-	2847-	2536-	2569-	2828-	2600-	2886-	2598-	3004-	2294-
ORISKANY	Absent		Absent	Absent						Absent
HELDERBERG KEYSER-BASS ISLANDS	3192- 3216-	3016-	2766-	2804-	3000-	2776-	3048-	2772-	3166-	2498-
SALINA GUELPH-LOCKPORT	3260- 3808-	3140 3712-	2842- 3400-	2879- 3420-	3120 3690-	3146 3458-	3450 3750-	2904 3430-	3572 3854-	2728- 3188-
CLINTON IRONDEQUOIT	4080- 4133-	3972-	3646- 3702-	3674- 3730-	3930-	3660- 3774-	3950- 4010-	3688-	4066- 4178-	3444- 3500-
MEDINA GRIMSBY WHIRLPOOL	4170- 4202- 4334-	4062-	3742- 3892-	3764- 3922-	4040-	3828- 3964-	4118- 4252-	3814-	4220- 4372-	3530- 3696-
QUEENSTON	4344-	4190-	3906-	3934-	4220-	3978-	4266-	3980-	4386-	3703-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4208-4272	4110-4186	3784-3836	3819-3855	4078-4166	3860-3910	4146-4188	3838-3918	4248-4380	3574-3642
TOTAL DEPTH	4455	4348	4005	4050	4333	4100	4411	4082	4537	3808
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,000 Mcf AF 1,120 psi/48 hrs. development Edinboro North field	250 Mcf AF 1,125 psi/24 hrs. development Waterford pool LeBoeuf field	350 Mcf AF 985 psi/24 hrs. development Waterford pool LeBoeuf field	4,000 Mcf AF 1,050 psi/24 hrs. development Waterford pool LeBoeuf field	450 Mcf AF 1,040 psi/24 hrs. development Alder Run field	5,000 Mcf AF 1,150 psi/24 hrs. development Waterford pool LeBoeuf field	300 Mcf AF 1,200 psi/24 hrs. extension Alder Run field	3,500 Mcf AF 1,110 psi/24 hrs. development Alder Run field	3,000 Mcf AF 1,250 psi/24 hrs. development Emmons pool Union City field	1,200 Mcf AF 1,100 psi/48 hrs development Swails pool Drumlin field

Figure 32. *(Continued)*

COUNTY Permit Number	Erie 23067	Erie 23083	Erie 23084	Erie 23087	Erie 23210	Fayette 20323	Indiana 27489	McKean 41771	Mercer 20193	Mercer 20373
NAME OF WELL	David G. Rupp #3	Herbert Williams #1	J. Landis #1	Wayne Hull #2	Mercyhurst College #1	Mellon Bank #21040	Martin Serro #1	Bingham-Foreman Lot 548 #1	Jack O. Stoyer #1	Richard Ligo #1
OPERATOR	N.E.A. Cross Company	N.E.A. Cross Company	C & C Troyer Brothers	Mitch-Well Energy, Incorporated	4-R Investment Company	Columbia Gas Transmission Corp.	J & J Enterprises, Incorporated	Pennzoil Company	Peoples Natural Gas #5485	DorSo Energy
TOWNSHIP	Washington	LeBoeuf	Waterford	Waterford	City of Erie	Henry Clay	Young	Keating	Delaware	Wolf Creek
QUADRANGLE	Cambridge Spg., NE	Cambridge Springs	Waterford	Cambridge Spg., NE	Erie South	Ohiopyle	McIntyre	Cyclone	Fredonia	Grove City
LATITUDE	1,100 ft. S 41°55'00"	3,300 ft. S 41°52'30"	7,050 ft. S 42°00'00"	14,650 ft, S 41°57'30"	6,950 ft, S 42°07'30"	5,100 ft. S 39°50'00"	100 ft. S 40°32'30"	13,650 ft. S 41°52'30"	9,350 ft. S 41°22'30"	7,250 ft. S 41°15'00"
LONGITUDE	9,750 ft. W 80°00'00"	800 ft. W 80°00'00"	11,000 ft. W 79°55'00"	7,300 ft, W 80°00'00"	3,850 ft, W 80°02'30"	5,850 ft. W 79°25'00"	11,250 ft. W 79°17'30"	3,450 ft. W 78°32'30"	9,300 ft. W 80°20'00"	2,300 ft. W 80°05'00"
DATE COMPLETED	7-12-83	8-11-83	8-16-83	7-26-83	8-30-83	9-18-82	5-21-83	2-4-83	7-28-80	12-29-81
ELEVATION	1560 GR	1250 GR	1360 GR	1515 GR	845 GR	2600 GR	1122 GR	1867 GR	1154 GR	1350 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC/CNL: 2299-4327	DBC: 2470-5340		GR/DBC: 2550-4258		OLL: 2595-8594 T: 2587-8610 SON: 100-8592 GR/CNL: 2595-8598	GR/DBC: 50-7814 GR/CBL: 4650-7698 PRL: 6500-7816	DBC/SON: 0-2342 OLL: 3195-5246 CNL/FDC: 3235-5358 Litho: 3235-5258	HDT: 844-5224 OLL: 844-5215 Tracer: 4800-5094 CNL/FDC/GR: 0-5090	GR/FDC/SNP: 0-6285
TULLY	2681-	2484-	2200-	2602-	1411-	8042-	6926-	4549-	3226-	4108-
ONONDAGA LIMESTONE CHERT	2902-	2708-	2314-	2820-	1640-	8150-	7470-	5016-	3368-	4288-
ORISKANY	Absent	Absent	2672-	Absent	Absent	8336-	7626-	Absent	3550-	Absent
HELDERBERG KEYSER-BASS ISLANDS	3172-	2965-	2680-	3086-		8436-	7648-	5064-	3568- 3578-	4426- 4494-
SALINA GUELPH-LOCKPORT	3276- 3695-	3003- 3584-		3153- 3671-				5178-	3709- 4546-	4604- 5508-
CLINTON IRONDEQUOIT	3963- 4016-	3854- 3916-	3560-	3922- 3983-	2738-				4821- 4876-	5828- 5971-
MEDINA GRIMSBY WHIRLPOOL	4050- 4214-	3968- 4114-	3620- 3822-	4026- 4182-	2780- 2924-				4940- 4976- 5132-	6030-
QUEENSTON	4222-	4124-	3830-	4187-	2938-				5146-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Oriskany	Huntersville			Medina
PRODUCING INTERVAL	4101-4150	3987-4036	3677-3736	4057-4117	2793-2838	8337-8352	7547-7555			6011-6026
TOTAL DEPTH	4350	4239	3940	4290	3000	8603	7815	5258	5255	6385
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Helderberg	Helderberg	Salina	Queenston	Medina
RESULTS	2,900 Mcf AF 1,000 psi/48 hre. development Edinboro North field	800 Mcf AF 1,100 psi/48 hrs. development Mill Village field	3,000 Mcf AF 1,150 psi/168 hrs. development Talcott pool	1,500 Mcf AF 750 psi/48 hrs. development Swails pool	988 Mcf AF 860 psi/48 hrs. extension Lawrence Park pool	310 Mcf AF 2,655 psi/72 hrs. development Ohiopyle field	411 Mcf Nat. 3,033 Mcf AF 3,825 psi/48 hrs. Deeper pool discovery	Plugged and abandoned extension Cyclone pool	Show of gas Plugged and abandoned extension Goodhope pool	139 Mcf Nat. 80 Mcf AF 1,380 psi/336 hrs. Deeper pool test Black Run

COUNTY Permit Number	Mercer 20374	Mercer 20375	Mercer 20377	Mercer 20378	Mercer 20380	Mercer 20389	Mercer 20390	Mercer 20391	Mercer 20392	Mercer 20439
NAME OF WELL	Paul W. Campbell #1	Joseph C. Rodgers #1	John K. Paxton #1	E. M. Foster #1	D. Reagle #1-S	Floyd Anderson #1	Gideon J. Byler #1	Robert S. Moose #1	Lee M. Hillmer #1	George V. Hunter #6243
OPERATOR	DorSo Energy	DorSo Energy	DorSo Energy	DorSo Energy	R. O. Werner, Inc. #HB-222-39	DorSo Energy	DorSo Energy	DorSo Energy	DorSo Energy	National Fuel Gas Supply Corp.
TOWNSHIP	Findley	Jackson	Findley	Jackson	Sugar Grove	East Lackawannock	East Lackawannock	East Lackawannock	Wilmington	Worth
QUADRANGLE	Mercer	Mercer	Grove City	Jackson Center	Greenville East	Greenfield	Greenfield	Greenfield	Greenfield	Sandy Lake
LATITUDE	6,950 ft. S 41°15'00"	1,900 ft. S 41°15'00"	9,950 ft. S 41°15'00"	12,150 ft. S 41°17'30"	13,550 ft. S 41°27'30"	14,550 ft. S 41°12'30"	15,000 ft. S 41°12'30"	1,850 ft. S 41°10'00"	8,000 ft. S 41°10'00"	5,800 ft. S 41°17'30"
LONGITUDE	2,900 ft. W 80°07'30"	4,050 ft. W 80°07'30"	11,150 ft. W 80°05'00"	6,950 ft. W 80°07'30"	250 ft. W 80°20'00"	8,000 ft. W 80°15'00"	2,450 ft. W 80°15'00"	50 ft. W 80°17'30"	7,500 ft. W 80°15'00"	8,800 ft. W 80°00'00"
DATE COMPLETED	1-8-82	1-20-82	12-21-81	2-12-82	1-26-82	2-22-82	3-7-82	2-26-82	2-22-82	12-7-82
ELEVATION	1285 GR	1295 GR	1325 GR	1270 GR	1213 GR	1200 GR	1310 GR	1300 GR	1300 GR	1433 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC/CNL: 9-6314	GR/CNL: 3500-6115	GR/DBC: 0-6136 GR/CNL/PCL: 5500-6247	GR/SNP: 3000-5113 GR/CNL/PCL: 3800-6018	GR/GO: 590-3898 DBC/CNL: 0-3905			GR/DBC: 3600-6160	GR: 0-6231 T: 3556-6231 FOC: 3620-6230	GR/IL: 3700-5778 GR/T: 0-5850 DBC/GR: 0-5800
TULLY	4007-	3996-	4088-	3910-	3148-	3856-	4003-	3942-	4018-	3866-
ONONDAGA LIMESTONE CHERT	4175-	4154-	4256-	4062-	3296-	4002-	4144-	4084-	4166-	4063-
ORISKANY	Absent	Absent	4400-	4207-	3498-	4160-	4292-	4324-	Absent	4250-
HELDERBERG KEYSER-BASS ISLANDS	4318- 4382-	4296- 4362-	4404- 4458-	4216- 4252-	Absent 3522-	4174- 4237-	4308- 4384-	4334- 4340-	4398- 4440-	4256- 4316-
SALINA GUELPH-LOCKPORT	4488- 5364-	4462- 5332-	4570- 5460-	4376- 5220-	3636- 4398-	4306- 5238-	4455- 5392-	4430- 5326-	4516- 5418-	4354- 5194-
CLINTON IRONDEQUOIT	5664- 5794-	5708- 5742-	5758-	5638- 5676-	4706- 4762-	5516- 5660-	5616- 5825-	5630- 5700-	5792- 5836-	5508- 5635-
MEDINA GRIMSBY WHIRLPOOL	5862- 5896- 6028-	5826- 5836- 5998-	5954- 6020- 6094-	5724- 5800- 5912-	4824- 4876- 5010-	5703- 5896-	5865- 6054-	5788- 5884- 5980-	5878- 5942- 6074-	Sect. missing, tectonic disturb. - Henderson Dome
QUEENSTON	6044-	6014-	6106-	5928-	5026-	5928-	6069-	5990-	6086-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Fractured shaly lithology
PRODUCING INTERVAL	5944-5958	5912-5936	6022-6145	5874-5832	4920-5014	5772-5855	5961-5981	5886-5941	5959-6036	5537-5851
TOTAL DEPTH	6280	6115	6137	6023	5059	6059	6257	6162	6231	5856
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	?
RESULTS	12 Mcf Nat. 134 Mcf AF 1,100 psi/120 hrs. development Pardoe pool Volant field	2 Mcf Nat. 615 Mcf AF 1,580 psi/168 hrs. development Pardoe pool Volant field	3 Mcf Nat. 140 Mcf AF 1,540 psi/336 hrs. extension Pardoe pool Volant field	15 Mcf Nat. 735 Mcf AF 1,580 psi/128 hrs. extension Pardoe pool Volant field	83 Mcf AF 1,400 psi/72 hrs. extension Thiel pool Greenville field	925 Mcf AF 1,300 psi/48 hrs. extension Ligo pool Volant field	160 Mcf Nat. 819 Mcf AF 1,580 psi/128 hrs. extension Ligo pool Volant field	10 Mcf Nat. 164 Mcf AF 1,600 psi/312 hrs. New pool discovery Ligo pool Volant field	15 Mcf Nat. 650 Mcf AF 1,660 psi/336 hrs. extension Ligo pool Volant field	22 Mcf AF 1,670 psi/696 hrs. extension Black Run pool Wolf Creek field

Figure 32. *(Continued)*

COUNTY Permit Number	Mercer 20461	Mercer 20464	Mercer 20466	Mercer 20470	Mercer 20475	Mercer 20477	Mercer 20479	Mercer 20489	Mercer 20494	Mercer 20496
NAME OF WELL	James Dean #1	Donald S. Ritter #1	L. Gruber #1	Charles Flickinger #1	F. Stevenson Unit #1	C. Barrows Unit #1	Denny T. Fonzo #1	Rosemarie Burkhardt #1	R. & M. McKeen #1	A. Bartman #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	R. D. Werner, Inc. #HB-222-6	Cabot Oil & Gas Corporation	R. D. Werner, Inc. #HB-222-7	R. D. Werner, Inc. #HB-222-16	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mitchell Energy Corporation	P.N.B. Petroleum Corporation
TOWNSHIP	French Creek	French Creek	Sugar Grove	French Creek	Sugar Grove	Sugar Grove	Millcreek	Hermitage	Lake	Deer Creek
QUADRANGLE	New Lebanon	New Lebanon	Greenville East	New Lebanon	Greenville East	Greenville East	New Lebanon	Sharpsville	Jackson Center	New Lebanon
LATITUDE	8,050 ft. S 41°30'00"	6,500 ft. S 41°30'00"	14,400 ft. S 41°30'00"	12,050 ft. S 41°30'00"	13,200 ft. S 41°30'00"	3,100 ft. S 41°27'30"	2,150 ft. S 41°25'00"	10,950 ft. S 41°17'30"	5,800 ft. S 41°20'00"	10,550 ft. S 41°30'00"
LONGITUDE	5,050 ft. W 80°00'00"	8,100 ft. W 80°00'00"	300 ft. W 80°20'00"	4,650 ft. W 80°02'30"	4,150 ft. W 80°20'00"	1,050 ft. W 80°20'00"	1,000 ft. W 80°00'00"	1,900 ft. W 80°25'00"	900 ft. W 80°10'00"	11,200 ft. W 80°05'00"
DATE COMPLETED	10-1-82	11-15-82	9-25-82	10-24-82	9-7-82	9-16-82	12-21-82	11-23-82	3-2-83	2-23-83
ELEVATION	1070 DR	1065 GR	1041 GR	1220 GR	1008 GR	1036 GR	1500 GR	1098 GR	1372 GR	1398 GR
LOGS RECEIVED AND LOGGED INTERVALS	OBC/GR/GO: 0-5168	GR/OBC: 0-5133 GO: 550-5122	OBC/GR/GO: 0-4808	OBC/GR/GO: 0-5329	OBC/GR/GO:475-4729	OBC/GR/GO: 0-4829	GR/OBC: 0-5844 GR/GO: 540-5842	GR/OBC/CNL:656-5358 OLL: 598-5359 Laser: 601-850, 3570-5284	CNL/LOT: 0-5854 OLL: 612-5842 OBC/SON: 612-5846 Litho: 0-5854	GR/FOC: 100-5412
TULLY	3270-	3245-	2909-	3442-	2846-	2916-	3912-		3838-	3454-
ONONDAGA LIMESTONE CHERT	3486-	3459-	3062-	3646-	2997-	3066-	4120-	3406-	3996-	3638-
ORISKANY	3632-	3608-	3258-	3796-	3195-	3262-	4248-	3580-	Bois Blanc 4138-4149	3809-
HELDERBERG KEYSER-BASS ISLANDS	3652- 3702-	3634-	3268- 3322-	3814- 3828-	3202- 3254-	3274- 3326-	4280- (Shriver)	3592- 3638-	4149-	3812-
SALINA GUELPH-LOCKPORT	3760- 4498-	3734- 4478-	3472- 4140-	3932- 4652-	3304- 4064-	3378- 4270-	4450- 5158-	3756- 4638-	4306- 5130-	3942- 4674-
CLINTON IRONDEQUOIT	4788- 4858-	4768- 4828-	4431- 4440-	4964- 5044-	4362- 4416-	4458- 4512-	5482- 5556-	4946- 5006-	5418- 5527-	5036- 5087-
MEDINA GRIMSBY WHIRLPOOL	4921- 4964- 5104-	4886- 4906- 5068-	4548- 4585-	5104- 5166- 5285-	4473- 4542- 4660-	4569- 4624- 4756-	5614- 5798-	5078- 5124- 5272-	5627- 5769-	5150- 5332-
QUEENSTON	5114-	5080-	4750-	5295-	4674-	4772-	5808-	5280-	5782-	5346-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4976-5062	4908-5021	4599-4641	5151-5216	4603-4658	4628-4676	5649-5749	5126-5279	5622-5778	5207-5263
TOTAL DEPTH	5173	5135	4810	5330	4740	4832	5846	5360	5862	5420
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	492 Mcf AF 1,450 psi/72 hrs. development Cochranton	1,300 Mcf AF 1,450 psi/168 hrs. development Kentz Corners	1,000 Mcf AF 1,300 psi/72 hrs. development Osborn	1,500 Mcf AF 1,450 psi/48 hrs. development Kentz Corners	1,200 Mcf AF 1,350 psi/72 hrs. development Osborn	962 Mcf AF 1,325 psi/72 hrs. development	IP not given 1,320 psi/336 hrs. extension	400 Mcf AF 1,472 psi/168 hrs. extension	613 Mcf AF 1,290 psi/139 hrs. Deeper pool	870 Mcf AF 1,500 psi/72 hrs. development

COUNTY Permit Number	Mercer 20497	Mercer 20479	Mercer 20500	Mercer 20503	Mercer 20507
NAME OF WELL	R. Smith #1	H. Gibson #1	J. Fitting #1	M. Piaouch #1	R. L. Paterson #1
OPERATOR	P.N.B. Petroleum Corporation	Mark Resources Corporation	Mark Resources Corporation	P.N.B. Petroleum Corporation	Mitchell Energy Corporation
TOWNSHIP	Deer Creek	Hermitage	South Pymatuning	Deer Creek	French Creek
QUADRANGLE	Hadley	Sharpsville	Sharpsville	New Lebanon	New Lebanon
LATITUDE	4,350 ft. S 41°27'30"	9,850 ft. S 41°17'30"	6,680 ft. S 41°17'30"	3,450 ft. S 41°27'30"	14,350 ft. S 41°30'00"
LONGITUDE	800 ft. W 80°07'30"	7,950 ft. W 80°25'00"	2,020 ft. W 80°27'30"	7,400 ft. W 80°05'00"	5,200 ft. W 80°00'00"
DATE COMPLETED	3-6-83	3-13-83	3-2-83	3-17-83	2-9-83
ELEVATION	1372 GR	1019 GR	1000 GR	1441 GR	1129 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR: 0-5436 CNL: 3700-5431 GD: 5100-5440 DBC: 484-5442	GR/DBC: 521-5198 DIL/LL: 521-5198 Laser: 730-5202	GR/DBC: 38-5100 DIL/LL: 497-5100 Laser: 4350-5060	GR/DBC/CNL: 607-5544 DLL: 607-5515	GR/CNL: 3300-5296
TULLY	3518-	3134-		3618-	3390-
ONONDAGA LIMESTONE CHERT	3696-	3264-	3188-	3804-	3602-
ORISKANY	3858-	Absent	3439-	3960-	3742-
HELDERBERG KEYSER-BASS ISLANDS	3886-	3454-	3538-	3992-	3764- 3778-
SALINA GUELPH-LOCKPORT	3996- 4780-	3616- 4490-	3550- 4416-	4100- 4890-	3890- 4624-
CLINTON IRONDEQUOIT	5062- 5136-	4800- 4853-	4698- 4784-	5166- 5228-	4950- 5050-
MEDINA GRIMSBY WHIRLPOOL	5188- 5254- 5380-	4926- 5120-	4858- 5050-	5290- 5330- 5474-	5111- 5136- 5258-
QUEENSTON	5390-	5130-	5059-	5486-	5268-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5258-529	4967-5040	4900-4967	5369-5394	5084-5226
TOTAL DEPTH	5444	5265	5175	5546	5351
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	200 Mcf AF 1,375 psi/72 hrs. extension Kantz Corners field	300 Mcf Nat. 444 Mcf AF 690 psi/72 hrs. development Sharon Deep pool Sharon field	1,008 Mcf AF 1,475 psi/72 hrs. development Sharon Deep pool Sharon field	800 Mcf AF 1,350 psi/72 hrs. development Kantz Corners field	628 Mcf AF 1,325 psi/166 hrs. development French Creek pool Utica field

COUNTY Permit Number	Mercer 20510	Mercer 20515	Mercer 20517	Mercer 20529	Mifflin 20001
NAME OF WELL	F. L. Shearer #1	Zahniser Unit #1	J. Janowiczyk #1	R. Trevitt #1	Daniel Sechrist #1
OPERATOR	Mitchell Energy Corporation	Mark Resources Corporation	P.N.B. Petroleum Corp. #HB-221-39	Mitchell Energy Corporation	Floyd A. Gearhart
TOWNSHIP	Millcreek	South Pymatuning	Deer Creek	Lake	Wayne
QUADRANGLE	New Lebanon	Sharpsville	Hadley	Jackson Center	Newton Hamilton
LATITUDE	5,300 ft. S 41°25'00"	8,160 ft. S 41°17'30"	9,250 ft. S 41°30'00"	12,400 ft. S 41°22'30"	6,200 ft. S 40°27'30"
LONGITUDE	9,600 ft. W 80°00'00"	2,350 ft. W 80°27'30"	3,750 ft. W 80°07'30"	11,350 ft. W 80°07'30"	3,950 ft. W 77°47'30"
DATE COMPLETED	1-27-83	6-3-83	4-2-83	7-6-83	10-2-82
ELEVATION	1396 GR	1010 GR	1444 GR	1383 GR	700 GR
LOGS RECEIVED AND LOGGED INTERVALS		DBC/SNL: 49-5164 GR/DIL: 500-5158 Laser: 700-5168 PCL: 4922-4980	PCL: 4400-5396	DBC/SNL: 16-5880 DLL/GR 633-5874	
TULLY	3794-	3078-		3930-	
ONONDAGA LIMESTONE CHERT	3990-	3204-	3636-	4090-	250-425
ORISKANY	4121-	3392-		4234-	425-476
HELDERBERG KEYSER-BASS ISLANDS	4134-	3412- 3454-		4292-	
SALINA GUELPH-LOCKPORT	4268- 5046-	3502- 4450-	4738-	4394- 5178-	
CLINTON IRONDEQUOIT	5332- 5436-	4750- 4802-	5045- 5100-	5474- 5558-	
MEDINA GRIMSBY WHIRLPOOL	5493- 5673-	4864- 5068-	5168- 5350-	5618- 5810-	
QUEENSTON	5685-	5084-	5363-	5822-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	
PRODUCING INTERVAL	5506-5684	4922-4980	5231-5275	5632-5818	
TOTAL DEPTH	5784	5200	5415	5890	476
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Oriskany
RESULTS	620 Mcf AF 1,420 psi/236 hrs. New pool discovery New Lebanon pool Sandy Lake field	22 Mcf Nat. 1,020 Mcf AF 1,520 psi/72 hrs. development Sharon Deep pool Sharon field	786 Mcf AF 1,475 psi/72 hrs. development Kantz Corners field	635 Mcf AF 1,450 psi/90 hrs. extension Lake pool Stoneboro field	Dry New field wildcat

Figure 32. *(Continued)*

COUNTY Permit Number	Venango 31221	Venango 31222	Venango 31223	Venango 33377	Venango 33390	Venango 33416	Venango 33814	Venango 33815	Venango 33883	Venango 33885
NAME OF WELL	Dale R. Craig #1	Gwendolyn J. Radko #1	William J. Thompson #1	John L. Salter #1	Mt. Pleasant Oil & Gas #1	Kenneth Hollabaugh #1	Catherine Teig #1	Rainbow Beagle Club #1	Russell Cherry #1	Dale E. Steadman #1
OPERATOR	DorSo Energy Company	DorSo Energy Company	DorSo Energy Company	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Victory	Victory	Victory	Canal	Canal	Canal	Sugar Creek	Jackson	Canal	Canal
QUADRANGLE	Polk	Polk	Kennerdell	Utica	Sugar Lake	Sugar Lake	Franklin	Sugar Lake	Utica	Utica
LATITUDE	1,625 ft. S 41°17'30"	9,700 ft. S 41°20'00"	14,450 ft. S 41°20'00"	10,250 ft. S 41°30'00"	14,050 ft. S 41°32'30"	6,650 ft. S 41°32'30"	14,900 ft. S 41°30'00"	14,400 ft. S 41°32'30"	3,700 ft. S 41°30'00"	4,180 ft. S 41°30'00"
LONGITUDE	1,450 ft. W 79°55'00"	7,700 ft. W 79°52'30"	9,950 ft. W 79°50'00"	10,200 ft. W 79°55'00"	9,600 ft. W 79°55'00"	9,500 ft. W 79°55'00"	1,900 ft. W 79°50'00"	8,100 ft. W 79°52'30"	5,000 ft. W 79°55'00"	4,530 ft. W 79°57'30"
DATE COMPLETED	2-12-82	2-1-82	2-16-82	12-21-82	11-26-82	11-14-82	2-3-83	12-11-82	1-16-83	2-24-83
ELEVATION	1520 GR	1460 GR	1520 GR	1340 GR	1580 GR	1350 GR	1485 GR	1310 GR	1525 GR	1505 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC/CNL: 500-1075, 4029-6620	GR/DBC/CNL: 900-6470		GR/DBC: 0-5558 GR/GD: 514-5555	GR/DBC/CNL: 0-5684 GD: 875-5678	GR/DBC: 0-5406	GR/GD: 636-2100 GR/DBC: 0-5940 PCL: 5500-5904	GR/DBC: 0-5512 GR/GD: 520-5504	GR/DBC: 0-5718 GR/LL: 546-5711	CNL/GR: 0-5620 DLL/GR: 630-5610 Litho: 0-5620
TULLY	4274-	4202-	4373-	3653-	3776-	3504-	3997-	3610-	3795-	3730-
ONONDAGA LIMESTONE CHERT	4502-	4450-	4633-	3880-	4002-	3736-	4234-	3834-	4026-	3950-
ORISKANY	Absent	4564-	4744-	4016-	4136-	3880-	4358-	3960-	4158-	4088-
HELDERBERG KEYSER-BASS ISLANDS	4693-	4618-	4752- 4802-	4048-	4160-	3900-	4380-	3968-	4190-	4118-
SALINA GUELPH-LOCKPORT	4802- 5704-	4724- 5596-	4874- 5774-	4160- 4886-	4276- 5052-	4036- 4746-	4500- 5256-	4096- 4864-	4296- 4994-	4224- 4958-
CLINTON IRONDEQUOIT		5884- 6066-	6052- 6284-	5210- 5268-	5334- 5396-	5034- 5120-	5585- 5654-	5130- 5262-	5360- 5422-	5274- 5345-
MEDINA GRIMSBY WHIRLPOOL		6114- 6148- 6258-	6312- 6484-	5336- 5376- 5516-	5456- 5500- 5580-	5168- 5354-	5714- 5890-	5280- 5452-	5484- 5538- 5656-	5398- 5585-
QUEENSTON		6268-	6492-	5528-	5644-	5366-	5906-	5463-	5670-	5592-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	6442-6506	6170-6265	6386-6437	5385-5478	5507-5590	5236-5315	5728-5835	5293-5412	5385-5478	5445-5544
TOTAL DEPTH	6626	6480	6655	5580	5688	5409	5946	5514	5718	5623
DEEPEST FORMATION REACHED	Queenston?	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	540 Mcf AF 1,300 psi/14 days extension	80 Mcf AF 1,750 psi/720 hrs. Deeper pool	240 Mcf AF 1,650 psi/48 hrs. New pool	1,600 Mcf AF 1,375 psi/72 hrs. development	320 Mcf AF 1,435 psi/48 hrs. development	2,200 Mcf AF 1,100 psi/240 hrs. development	2,300 Mcf AF 1,100 psi/14 days extension	960 Mcf AF 1,412 psi/48 hrs. development	640 Mcf AF 1,470 psi/72 hrs. development	1,300 Mcf AF 1,340 psi/92 hrs. development

COUNTY Permit Number	Venango 33887	Venango 33889	Warren 28252	Warren 28589	Warren 28594	Warren 28799	Warren 28843	Warren 28918	Warren 29187	Warren 29208
NAME OF WELL	Gage Allam #1	Howard L. Fisher #1	Emma Brunecz Johnson #1	Alan Gourley #1	Donald Little #1	Dan Byler #1	Chester Borjeraki #1	Enoch B. Cornish #1	A. C. Gribshaw Unit #2	Herbert Gourley #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Arrowhead Gas Producers, Inc.	Monroe Resources, Limited	U. S. Energy Development Corp.	Arrowhead Gas Producers, Inc.	U. S. Energy Development Corp.	U. S. Energy Development Corp.	Beree Oil & Gas Corporation	Monroe Resources Limited
TOWNSHIP	French Creek	Oakland	Sugar Grove	Freehold	Sugar Grove	Freehold	Freehold	Freehold	Eldred	Sugar Grove
QUADRANGLE	Utica	Franklin	Lottsville	Lottsville	Lottsville	Lottsville	Columbus	Lottsville	Spring Creek	Lottsville
LATITUDE	3,500 ft. S 41°27'30"	4,000 ft. S 41°30'00"	3,300 ft. S 42°00'00"	10,600 ft. S 42°00'00"	7,600 ft. S 41°57'30"	10,650 ft. S 42°00'00"	550 ft. S 41°57'30"	9,050 ft. S 42°00'00"	13,690 ft. S 41°47'30"	12,750 ft. S 42°00'00"
LONGITUDE	4,050 ft. W 79°57'30"	11,350 ft. W 79°47'30"	4,950 ft. W 79°22'30"	5,900 ft. W 79°22'30"	1,400 ft. W 79°22'30"	3,050 ft. W 79°25'00"	300 ft. W 79°30'00"	1,600 ft. W 79°27'30"	11,220 ft. W 79°32'30"	2,750 ft. W 79°22'30"
DATE COMPLETED	1-16-83	2-2-83	6-23-80	5-16-81	2-19-81	2-4-81	1-11-81	1-21-81	5-29-81	5-10-81
ELEVATION	1060 GR	1470 GR	1725 GR	1650 GR	1881 GR	1665 GR	1577 GR	1410 GR	1701 KB	1780 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC: 526-5270 DLL: 459-5333	GR/DBC/CNL: 0-5832 GD: 607-5828		OR/FDC/CNL: 3298-4807 LL: 3300-4803				GR/DBC: 2740-4497 DLL: 2722-4496 Laser: 4220-4402	GR/DBC: 0-5468 DLL: 600-5454 PCL: 4950-5429	FDC/GR/CNL: 1600-4970 OLL: 3452-4969
TULLY	3371-	3893-	3076-		3650-	3053-		2764-	3668-	
ONONDAGA LIMESTONE CHERT	3594-	4134-	3358-	3361-	3710-	3337-	3221-	3048-	3936-	
ORISKANY	3730-	4260-		Absent			3275-	Absent	Absent	Absent
HELDERBERG KEYSER-BASS ISLANDS	3762-	4292-		3530-			3388-	3224- 3250-	4068-	3682- 3697
SALINA GUELPH-LOCKPORT	3876- 4662-	4412- 5178-	4192-	3590- 4164-	4238-	3562-	3445- 4011-	3282- 3850-	4134- 4776-	3742- 4290-
CLINTON IRONDEQUOIT	4968- 5058-	5488- 5538-	4548-	4420- 4507-	4866-	4136- 4396-	4236- 4346-	4110- 4184-	5080- 5144-	4588- 4674-
MEDINA GRIMSBY WHIRLPOOL	5116- 5150-	5608- 5645- 5772-	4600- 4726	4556- 4710-	4910- 5068	4495-	4388- 4552-	4222- 4262- 4390-	5194- 5228- 5354-	4718- 4872-
QUEENSTON		5785-	4739-	4719-	5086-	4691-	4569-	4401-	5368-	4890-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina		Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5153-5230	5650-5735	4606-4733	4603-4712	4982-5083		4436-4562	4265-4395	5286-5359	4761-4883
TOTAL DEPTH	5338	5832	4880	4814	5186	4803	4638	4501	5468	4970
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	305 Mcf AF 1,482 psi/72 hrs. extension French Creek pool Utica field	490 Mcf AF 1,483 psi/72 hrs. extension Beatty Run pool Cooperstown field	600 Mcf AF 1,180 psi/48 hrs. development Freehold pool Stillwater field	950 Mcf AF 1,190 psi/48 hrs. development Freehold pool Stillwater field	25 Mcf Nat. 325 Mcf AF 1,240 psi/48 hrs. development Pikes Rocks pool Youngsville field	Dry and abandoned development Freehold pool Stillwater field	35 Mcf Nat. 2,050 Mcf AF 1,210 psi/48 hrs. development Dewey Corners pool Columbus field	10 Mcf Nat. 450 Mcf AF 1,240 psi/72 hrs. development Freehold pool Stillwater field	962 Mcf AF 1,250 psi/72 hrs. development Three Bridge pool Selkirk field	1,450 Mcf AF 1,270 psi/48 hrs. development Sewko pool Stillwater field

Figure 32. *(Continued)*

COUNTY Permit Number	Warren 29209	Warren 29383	Warren 29384	Warren 29396	Warren 29624	Warren 29661	Warren 29663	Warren 29689	Warren 29955	Warren 29967
NAME OF WELL	R. Gruber & W. Black #1	James Woodworth #1	Nick Savko #1	Joseph Rutsky #1	M. Zurken #1	Midwest Campers, Incorporated #1	J. Rupczyk #1	Paul Suchar #1	Milo Koren #1	F. Russell #1
OPERATOR	Arrowhead Gas Producers, Inc.	Villanova Natural Gas Corporation	Villanova Natural Gas Corporation	Arrowhead Gas Producers, Inc.	Sagebrush Resources, Inc.	Cumberland Oil Corporation	Cumberland Oil Corporation	Villanova Natural Gas Corporation	Monroe Resources Limited	Monroe Resources Limited
TOWNSHIP	Sugar Grove	Columbus	Columbus	Sugar Grove	Sugar Grove	Sugar Grove	Sugar Grove	Columbus	Freehold	Freehold
QUADRANGLE	Sugar Grove	Columbus	Columbus	Lottsville	Sugar Grove	Sugar Grove	Sugar Grove	Columbus	Lottsville	Lottsville
LATITUDE	6,050 ft. S 41°57'30"	12,870 ft. S 41°57'30"	10,800 ft. S 41°57'30"	13,300 ft. S 41°57'30"	1,900 ft. S 41°57'30"	500 ft. S 41°57'30"	12,450 ft. S 42°00'00"	10,630 ft. S 41°57'30"	13,400 ft. S 42°00'00"	3,700 ft. S 42°00'00"
LONGITUDE	6,300 ft. W 79°20'00"	7,150 ft. W 79°32'30"	8,770 ft. W 79°30'00"	2,250 ft. W 79°22'30"	5,900 ft. W 79°20'00"	7,150 ft. W 79°20'00"	7,250 ft. W 79°20'00"	4,600 ft. W 79°32'30"	8,250 ft. W 79°20'00"	11,075 ft. W 79°22'30"
DATE COMPLETED	5-11-81	7-12-81	7-3-81	6-26-82	8-14-81	8-5-81	7-27-81	9-4-81	8-20-81	8-26-81
ELEVATION	1730 GR	1556 GR	1493 GR	1930 GR	1830 GR	1835 GR	1684 GR	1555 GR	1400 GR	1735 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/OBC: 400-5020	GR/FDC: 2000-4709	GR/FDC: 2750-4616 LL: 3456-4609 T: 2750-4620 Laser: 4300-4590	GR/CNL: 314-5284			GR/FDC: 2900-4968 LL: 2900-4965 IL: 650-1104 T: 3000-4950	GR/FDC: 500-4660 GR/IL: 3100-4662 PCL: 4463-4581 Laser: 4574-4594	GR/FDC: 2460-4506 GR/IL: 393-4508 LL: 3928-4506 Laser: 4180-4374	GR/FDC: 2780-4802 LL: 4300-4797 Laser: 4530-4730
TULLY	3384-	2988-	2900-	3528-	3387-	3313-	3183-		2783-	3059-
ONONDAGA LIMESTONE CHERT	3569-	3276-	3189-	3804-	3669-	3600-	3472-	3236-	3062-	3354-
ORISKANY	Absent	Absent	Absent	Absent		3645-	Absent	3396-		Absent
HELDERBERG KEYSER-BASS ISLANDS	3710- 3746-	3440-	3351-	3950-			3630-	3409-		3532-
SALINA GUELPH-LOCKPORT	3770- 4374-	3506- 4084-	3422- 3974-	4012- 4614-	4164	4110	3689- 4286-	3464- 4024-	3288- 3859-	3586- 4158-
CLINTON IRONDEQUOIT	4652- 4720-	4333- 4415-	4236- 4326-	4868- 4956-	4827-	4775-	4545- 4629-	4292- 4374-	4113- 4193-	4418- 4496-
MEDINA GRIMSBY WHIRLPOOL	4768- 4770- 4929-	4450- 4628-	4364- 4535-	4998- 5167-	4869- 5024-	4804- 4960-	4672- 4830-	4404- 4576-	4232- 4395-	4536- 4700-
QUEENSTON	4941-	4639-	4548-	5176-	5040-	4977-	4842-	4591-	4410-	4714-
PRODUCING FORMATION		Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL		4499-4635	4411-4547	5057-5173	4960-5033	4846-4920	4716-4841	4463-4581	4252-4406	4560-4706
TOTAL DEPTH	5027	4644	4550	5294	5140	5020	4963	4594	4528	4804
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	Dry and abandoned extension Mikrut pool Sugar Grove field	1,800 Mcf AF 1,200 psi/48 hrs. development Whites Run pool Columbus	200 Mcf Nat. 2,700 Mcf AF 1,175 psi/48 hrs. development Whites Run pool	900 Mcf AF 1,275 psi/48 hrs. extension Pikes Rocks pool Youngsville	30 Mcf AF 750 psi/48 hrs. development Mikrut pool Sugar Grove	988 Mcf AF 1,280 psi/48 hrs. development Pikes Rocks pool Youngsville	3,786 Mcf AF 1,200 psi/48 hrs. development Stillwater field	Production not reported development Whites Run pool Columbus	2,464 Mcf AF 1,175 psi/48 hrs. development Freehold pool Stillwater	2,449 Mcf AF 1,165 psi/48 hrs. development Freehold pool Stillwater

COUNTY Permit Number	Warren 29974	Warren 30126	Warren 30158	Warren 30184	Warren 30188	Warren 30338	Warren 30340	Warren 30342	Warren 30536	Warren 30537
NAME OF WELL	L. Skinner #1	Midwest Campers #2	E. Leffler #1	John & Donna Little #4	Messenger #1	A. A. & M. Flick #1	Beatrice Iole Ley #2	J. L. & J. Johnson #1	M. J. Wojtowicz Unit #2	M. J. Wojtowicz Unit #6
OPERATOR	Arrowhead Gas Producers, Inc.	Cumberland Oil Corporation	Cumberland Oil Corporation	Arrowhead Gas Producers, Inc.	Niagaran Develop. Company, Inc.	Berea Oil & Gas Corporation	Berea Oil & Gas Corporation	Berea Oil & Gas Corporation	Berea Oil & Gas Corporation	Berea Oil & Gas Corporation
TOWNSHIP	Freehold	Sugar Grove	Sugar Grove	Freehold	Spring Creek	Southwest	Eldred	Eldred	Eldred	Eldred
QUADRANGLE	Columbus	Sugar Grove	Sugar Grove	Lotteville	Spring Creek	Grand Valley	Spring Creek	Grand Valley	Spring Creek	Spring Creek
LATITUDE	4,750 ft. S 42°00'00"	1,800 ft. S 41°57'30"	11,100 ft. S 42°00'00"	9,000 ft. S 41°57'30"	14,250 ft. S 41°52'30"	12,250 ft. S 41°42'30"	2,160 ft. S 41°47'30"	6,300 ft. S 41°45'00"	2,700 ft. S 41°47'30"	4,780 ft. S 41°47'30"
LONGITUDE	3,700 ft. W 79°00'00"	8,900 ft. W 79°20'00"	5,050 ft. W 79°20'00"	9,750 ft. W 79°22'30"	3,750 ft. W 79°32'30"	3,700 ft. W 79°32'30"	9,100 ft. W 79°32'30"	1,990 ft. W 79°32'30"	5,590 ft. W 79°35'00"	9,050 ft. W 79°32'30"
DATE COMPLETED	7-24-82	11-29-81	12-6-81	6-18-82	10-29-81	11-14-81	12-6-81	11-23-81	1-2-82	12-16-81
ELEVATION	1530 GR	1840 GR	1604 GR	1855 GR	1690 GR	1610 GR	1650 GR	1688 GR	1700 GR	1767 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/CNL/FDC: 260-4500	GR/CNL/DBC: 3000-5104 LL: 3000-5101	GR/CNL/DBC: 1500-4784 LL: 3302-4782	GR/FDC: 304-5150	GR/DBC/CNL: 0-5104 GR/IL: 485-5100	DBC/GR: 0-679 DLL: 664-5714 PCL: 5250-5658 DBC: 0-5728	GR/DBC: 0-5288 DLL/PCL: 4800-5190	GR/FDC: 0-5574 DLL: 616-5563 PCL: 5150-5530	GR/DBC: 0-5314 LL: 600-5314 PCL: 4850-5224	GR/DBC: 0-5431 LL: 0-5431 PCL: 4950-5384
TULLY	2756-	3366-		3414-	3394-	3862-	3504-	3754-	3522-	3630-
ONONDAGA LIMESTONE CHERT	3042-	3652-	3334-	3702-	3656-	4144-	3774-	4032-	3786-	3900-
ORISKANY	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
HELDERBERG KEYSER-BASS ISLANDS	3218-	3806-	3488-	3850-	3798-	4250- 4278-	3920-	4154- 4186-	3932-	4044-
SALINA GUELPH-LOCKPORT	3278- 3850-	3868- 4462-	3546 4140-	3910- 4450-	3861- 4472-	4352- 5030-	3992- 4630-	4220- 4896-	3998- 4650-	4116- 4742-
CLINTON IRONDEQUOIT	4110- 4180-	4724- 4806-	4402- 4484-	4750- 4834-	4758- 4808-	5306- 5378-	4912- 4972-	5174- 5242-	4924- 4986-	5046- 5104-
MEDINA GRIMSBY WHIRLPOOL	4218- 4260- 4372-	4850- 4890- 5008-	4526- 4562- 4680-	4888- 5040-	4854- 4888- 5012-	5454- 5475- 5604-	5020- 5058- 5184-	5284- 5322- 5457-	5028- 5066- 5194-	5148- 5196- 5318-
QUEENSTON	4394-	5028-	4700-	5058-	5026-	5616-	5198-	5472-	5208-	5332-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4275-4387	4894-5021	4576-4693	4931-5054	4901-5061	5478-5556	5071-5177	5335-5468	5095-5148	5265-5289
TOTAL DEPTH	4500	5104	4786	5116	5105	5727	5298	5472	5316	5431
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	4,000 Mcf AF 1,025 psi/72 hrs. extension Dewey Corners pool Columbus field	1,596 Mcf AF 1,210 psi/48 hrs. development Pikes Rocks pool Youngsville field	388 Mcf AF 1,285 psi/48 hrs. development Stillwater field	2,000 Mcf AF 1,200 psi/48 hrs development Sevko pool Stillwater field	1,300 Mcf AF 1,250 psi/48 hrs. development County Line field	1,100 Mcf AF 1,300 psi/72 hrs. Deeper pool discovery Campbell Creek pool Goodwill Hill-Grand Valley field	1,000 Mcf AF 450 psi/72 hrs. development County Line field	1,000 Mcf AF 1,275 psi/72 hrs. extension Trimm pool Sanford field	900 Mcf AF 400 psi/72 hrs. development County Line field	1,000 Mcf AF 450 psi/72 hrs. development Trimm pool Sanford field

Figure 32. *(Continued)*

COUNTY Permit Number	Warren 30600	Warren 30601	Warren 30631	Warren 31034	Warren 31095	Warren 31131	Warren 31178	Warren 31340	Warren 31357	Warren 31402
NAME OF WELL	Charles Bimber #1A	F. Hale #1	William Saunders #3	M. Sekerak #3	D. Sekerak #2	O. Boardman #1	Joan Pokosh #1	J. Rupczyk #1	B. I. Lay #3	J. R. Williams #1
OPERATOR	Arrowhead Gas Producers, Inc.	J & L Oil & Gas Corporation	Arrowhead Gas Producers, Inc.	Universal Resources Holdings, Inc.	Universal Resources Holdings, Inc.	Arrowhead Gas Producers, Inc.	Seis-Ex Geophysical, Ltd.	Cumberland Oil Corporation	Berea Oil & Gas Corporation	Cumberland Oil Corporation
TOWNSHIP	Sugar Grove	Sugar Grove	Sugar Grove	Columbus	Columbus	Sugar Grove	Freehold	Sugar Grove	Eldred	Sugar Grove
QUADRANGLE	Lottsville	Sugar Grove	Lottsville	Lottsville	Columbus	Lottsville	Lottsville	Sugar Grove	Grand Valley	Sugar Grove
LATITUDE	9,300 ft. S 41°57'30"	10,400 ft. S 42°00'00"	5,700 ft. S 41°57'30"	6,470 ft. S 41°55'00"	8,800 ft. S 41°57'30"	5,500 ft. S 41°57'30"	6,850 ft. S 41°57'30"	14,150 ft. S 42°00'00"	790 ft. S 41°45'00"	15,000 ft. S 42°20'00"
LONGITUDE	2,150 ft. W 79°22'30"	3,400 ft. W 79°20'00"	1,000 ft. W 79°22'30"	9,650 ft. W 79°27'30"	5,875 ft. W 79°35'00"	3,500 ft. W 79°22'30"	6,300 ft. W 79°22'30"	8,400 ft. W 79°20'00"	4,400 ft. W 79°35'00"	10,400 ft. W 79°20'00"
DATE COMPLETED	1-16-82	12-16-81	6-30-82	3-5-82	3-11-82	6-22-82	6-23-82	6-9-82	7-14-82	6-14-82
ELEVATION	1900 GR	1540 GR	1895 GR	1634 GR	1415 GR	1825 GR	1902 GR	1784 GR	1678 GR	1822 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/FDC: 286-5164	IL/GR: 650-1150 GR/FDC/SNP:649-4745 GR/PCL: 4400-4700 DLL: 4300-4735	GR/CNL/OBC: 308-5190	GR/FDC: 2789-4934 LL: 4496-4931	GR/FDC: 2399-4486 LL: 2395-4483	OBC/GR: 370-5100 PCL: 4770-5028	GR/IL: 1000-5132 OBC: 0-5142	GR/FDC: 3419-4994 LL: 4447-4986	OBC/GR: 0-5499 GR/IL: 474-5490 PCL: 5000-5348	GR/CNL/OBC: 3437-5089
TULLY	3474-			3174-	2750-	3351-	3440-		3634-	
ONONDAGA LIMESTONE CHERT	3758-	3290-	3714-	3458-	3024-	3634-	3720-	3544-	3902-	3596-
ORISKANY		3454-	Absent		Absent		Absent	3698-	Absent	Absent
HELDERBERG KEYSER-BASS ISLANDS	3904-	3480-	3862-	3613-	3200-	3784-	3870-	3704-	4036- 4072-	3753-
SALINA GUELPH-LOCKPORT	3962- 4542-	3504- 4102-	3868- 4514-	3676- 4286-	3268- 3832-	3843- 4450-	3925- 4519-	3756- 4352-	4100- 4754-	3812- 4404-
CLINTON IRONDEQUOIT	4816- 4904-	4362- 4448-	4774- 4852-	4534- 4623-	4114- 4180-	4698- 4787-	4763- 4856-	4610- 4698-	5030- 5101-	4664- 4748-
MEDINA GRIMSBY WHIRLPOOL	4950- 5118-	4488- 4530- 4646-	4900- 4940- 5058-	4660- 4837-	4222- 4378-	4844-4930 4992-5008	4920- 5061-	4748- 4896-	5144- 5312-	4804- 4834- 4946-
QUEENSTON	5128-	4664-	5078-	4848-	4393-	5008-	5076-	4910-	5324-	4968-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina		Medina	Medina	Medina
PRODUCING INTERVAL		4532-4657	4955-5069	4685-4843	4257-4389	4876-5000		4778-4860	5200-5274	4851-4919
TOTAL DEPTH	5165	4745	5149	4995	4507	5063	5146	5022	5499	5089
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	Dry and abandoned development Pikes Rocks pool	639 Mcf AF 1,050 psi/48 hrs. extension Mikrut pool	2,400 Mcf AF 1,250 psi/? hrs. development Pikes Rocks pool	1,813 Mcf AF 1,280 psi/48 hrs. extension Whitee Run pool	1,162 Mcf AF 1,260 psi/48 hrs. extension Stroup pool	1,000 Mcf AF 1,200 psi/72 hrs. development Pikes Rocks pool	Show of gas in Onondaga development Sevko pool	895 Mcf AF 1,285 psi/72 hrs. development Stillwater field	1,100 Mcf AF 1,200 psi/72 hrs. extension Three Bridge pool	65 Mcf AF 850 psi/72 hrs. development Pikes Rocks pool

COUNTY Permit Number	Warren 31532	Warren 31551	Warren 31552	Warren 31554	Warren 31747	Warren 31748	Warren 31749	Warren 31756	Warren 31757	Warren 31758
NAME OF WELL	J. Little #3	B. Lay #10	M. Wojtowicz Unit #4	M. Wojtowicz Unit #3	Johnston Moon #1	Johnston Moon #3	A. Savko #2	Cecil & Gertrude Miller #1	Frank R. & Eleanor Foster #1	Lawrence & Annie Miller #1
OPERATOR	Jennifer Petroleums, Limited	Berea Oil & Gas Corporation	Berea Oil & Gas Corporation	Berea Oil & Gas Corporation	U. S. Energy Development Corp.	U.S. Energy Development Corp.	U. S. Energy Development Corp.	Devonian Energy Corporation	Devonian Energy Corporation	Devonian Energy Corporation
TOWNSHIP	Freehold	Eldred	Eldred	Eldred	Freehold	Columbus	Freehold	Columbus	Columbus	Columbus
QUADRANGLE	Lottsville	Spring Creek	Spring Creek	Spring Creek	Columbus	Columbus	Columbus	Columbus	Columbus	Columbus
LATITUDE	6,700 ft. S 41°57'30"	1,800 ft. S 41°47'30"	1,700 ft. S 41°47'30"	850 ft. S 41°47'30"	14,170 ft. S 42°00'00"	12,550 ft. S 42°00'00"	925 ft. S 41°57'30"	12,520 ft. S 42°00'00"	11,410 ft. S 42°00'00"	3,200 ft. S 41°57'30"
LONGITUDE	8,900 ft. W 79°22'30"	10,900 ft. W 79°35'00"	3,875 ft. W 79°35'00"	5,600 ft. W 79°35'00"	1,675 ft. W 79°30'00"	150 ft. W 79°30'00"	2,525 ft. W 79°30'00"	1,400 ft. W 79°35'00"	5,800 ft. W 79°32'30"	4,620 ft. W 79°35'00"
DATE COMPLETED	7-18-82	8-22-82	8-4-82	8-13-82	9-7-82	9-14-82	8-30-82	9-19-82	10-5-82	9-10-82
ELEVATION	1890 GR	1630 GR	1671 GR	1600 GR	1687 GR	1710 GR	1615 GR	1440 GR	1664 GR	1460 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/DBC: 346-5154 PCL: 4800-5080	GR/DBC: 0-5286 LL: 940-5254 PCL: 4700-5214	GR/DBC: 900-5298 LL: 900-5298 PCL: 4900-5270	GR/DBC: 0-5228 LL: 910-5220 PCL: 4800-5148	DBC/GR: 2693-4727 DI/LL: 3902-4727 PCL: 4487-4629 Laser: 4410-4650	GR/DBC: 2431-4742 DLL: 2505-4743 PCL: 4596-4657	DBC/GR: 2699-4675 DI/LL: 2502-4674 Laser: 4425-4610	DBC/GR 0-4438 GR/IL· 437-4439 Strata· 2950-4320	GR/GO: 2000-4630 GR/IL: 423-2100 DBC/GR: 0-4635 Strata: 2200-4545	GR/GD: 440-4400 DBC/GR: 0-4403
TULLY	3430-	3465-	3483-	3412-	3014-	3038-	2954-	2691-	2928-	2748-
ONONDAGA LIMESTONE CHERT	3716-	3734-	3748-	3675-	3294-	3318-	3234-	2959-	3195-	3024-
ORISKANY		Absent	Absent	Absent	Absent	Absent	Absent			
HELDERBERG KEYSER-BASS ISLANDS	3867-	3878-	3894-	3822-	3463-	3486-	3403-	3149-	3379-	3212-
SALINA GUELPH-LOCKPORT	3924- 4514-	3996- 4598-	4006- 4612-	3892- 4536-	3522- 4067-	3542- 4116-	3462- 4028-	3204- 3765-	3430- 4000-	3267- 3839-
CLINTON IRONDEQUOIT	4764- 4850-	4880- 4940-	4894- 4954-	4818- 4875-	4340- 4420-	4370- 4444-	4282- 4360-	4013- 4088-	4251- 4324-	4089- 4166-
MEDINA GRIMSBY WHIRLPOOL	(Thorold) 4870- 4892-5030 5062-	4988- 5024- 5148-	5004- 5042- 5166-	4926- 4962- 5088-	4456- 4622-	4484- 4530- 4645-	4399- 4566-	4160- 4287-	4406- 4526-	4236- 4364-
QUEENSTON	5076-	5160-	5178-	5100-	4633-	4661-	4580-	4308-	4546-	4378-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4964-5065	5010-5158	5081-5178	4967-5053	4487-4629	4562-4657	4457-4577	4171-4305	4410-4542	4241-4329
TOTAL DEPTH	5123	5286	5298	5228	4761	4744	4696	4691	4662	4450
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	2,200 Mcf AF 1,050 psi/72 hrs. development Savko pool Stillwater field	1,800 Mcf AF 1,300 psi/72 hrs. development County Line field	1,250 Mcf AF 1,200 psi/72 hrs. development County Line field	1,500 Mcf AF 1,200 psi/72 hrs. development County Line field	461 Mcf AF 1,070 psi/48 hrs. development Dewey Corners pool Columbus field	398 Mcf AF 985 psi/48 hrs. development Dewey Corners pool Columbus field	1,260 Mcf AF 1,130 psi/48 hrs. development Dewey Corners pool Columbus field	100 Mcf AF 1,210 psi/72 hrs. extension Stoup pool Brokenstraw field	157 Mcf AF 1,200 psi/72 hrs. development Dewey Corners pool Columbus field	IP not given 1,010 psi/72 hrs extension Stroup pool Brokenstraw field

Figure 32. *(Continued)*

COUNTY Permit Number	Warren 31759	Warren 31790	Warren 31791	Warren 31836	Warren 31888	Warren 31991	Warren 31992	Warren 31993	Warren 32106	Warren 32107
NAME OF WELL	Edward F. Demby #1	Corry Rod and Gun Club #1	Lawrence & Annie Miller #2	John Zajac #3	John Zajac #4	R. Ruhlman #3	R. Ruhlman #2	C. Messenger #1	Bunting Unit #1	Andrew M. Petko #1
OPERATOR	Devonian Energy Corporation	U.S. Energy Development Corp.	Devonian Energy Corporation	U.S. Energy Development Corp.	U. S. Energy Development Corp.	Penn Ohio Energy Corporation	Penn Ohio Energy Corporation	Penn Ohio Energy Corporation	Berea Oil & Gas Corporation	Berea Oil & Gas Corporation
TOWNSHIP	Columbus	Columbus	Columbus	Columbus	Columbus	Columbus	Columbus	Freehold	Spring Creek	Spring Creek
QUADRANGLE	Columbus	Columbus	Columbus	Columbus	Columbus	Columbus	Lottsville	Lottsville	Spring Creek	Spring Creek
LATITUDE	14,310 ft. S 42°00'00"	4,800 ft. S 41°57'30"	1,180 ft. S 41°57'30"	11,735 ft. S 42°00'00"	13,735 ft. S 42°00'00"	9,465 ft. S 41°57'30"	11,375 ft. S 41°57'30"	10,920 ft. S 41°55'00"	10,330 ft. S 41°50'00"	8,370 ft. S 41°50'00"
LONGITUDE	9,100 ft. W 79°32'30"	7,035 ft. W 79°32'30"	4,950 ft. W 79°35'00"	3,635 ft. W 79°30'00"	3,650 ft. W 79°30'00"	435 ft. W 79°30'00"	10,365 ft. W 79°27'30"	8,430 ft. W 79°27'30"	4,650 ft. W 79°32'30"	7,460 ft. W 79°30'00"
DATE COMPLETED	9-29-82	9-19-82	10-11-82	11-16-82	11-10-82	10-7-82	10-5-82	10-10-82	11-24-82	11-30-82
ELEVATION	1415 GR	1472 GR	1568 GR	1580 GR	1495 GR	1448 GR	1625 GR	1645 GR	1676 GR	1740 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/OBC/CNL:0-4384 GR/IL: 412-4372 Strata: 2935-4350	GR/OBC/CNL:2500-4510 OLL: 2493-4508 PCL: 4399-4347 Laser: 4210-4416	GR/OBC/CNL:0-4547 GR/IL: 423-4534 Strata: 3090-4547	GR/OBC: 2609-4610 OLL: 2602-4605 Laser: 4322-4503		GR/OBC/CNL: 502-4619 DLL: 2606-4621	GR/FOC: 2774-4804 OI/LL: 2734-4795	GR/OBC: 2830-4870 OLL: 2855-4871	GR/FOC: 50-5271 T: 50-5272 OLL: 975-5256 Litho: 50-5271	GR/CNL: 0-5324 GR: 4850-5270 OLL: 545-5310 Litho- 0-5324
TULLY	2684-	2796-	2844-	2874-	2798-		3092-	3114-	3492-	3540-
ONONDAGA LIMESTONE CHERT	2952-	3070-	3112-	3158-	3088-	3178-	3380-	3400-	3754-	3810-
ORISKANY		Absent		Absent		Absent	Absent	Absent		Absent
HELDERBERG KEYSER-BASS ISLANDS	3136-	3245-	3304- 3330-	3332-		3340-	Absent 3547-	3558-	3893-	3960-
SALINA GUELPH-LOCKPORT	3191- 3752-	3306- 3870-	3357- 3929-	3390- 3956-	3600-	3402- 3970-	3616- 4172-	3618- 4192-	3956- 4600-	4024- 4648-
CLINTON IRONDEQUOIT	3999- 4076-	4136- 4194-	4179- 4257-	4240- 4282-	4212-	4226- 4304-	4419- 4508-	4446- 4528-	4867- 4939-	4916- 4988-
MEDINA GRIMSBY WHIRLPOOL	4166- 4276-	4232- 4254- 4396-	4326- 4422-	4322- 4365- 4486-	4249- 4418	4344- 4393- 4508-	4559- 4718-	4568- 4614- 4736-	4981- 5151-	5028- 5203-
QUEENSTON	4290-	4416-	4466-	4504-	4436-	4526-	4728-	4754-	5162-	5212-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4168-4241	4292-4405	4330-4464	4377-4496	4308-4429	4404-4523	4602-4726	4618-4752	5048-5120	5083-5166
TOTAL DEPTH	4406	4512	4595	4610	4565	4621	4849	4872	5274	5330
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	IP not given 1,060 psi/72 hrs. development Stroup pool	1,170 Mcf AF 1,245 psi/48 hrs. development Dewey Corners pool	IP not given 1,210 psi/72 hrs. development Stroup pool	1,980 Mcf AF 1,190 psi/48 hrs. development Dewey Corners pool	1,162 Mcf AF 1,020 psi/48 hrs. development Dewey Corners pool	639 Mcf AF 1,060 psi/48 hrs. development Whites Run pool	725 Mcf AF 1,120 psi/48 hrs. development Whites Run pool	1,162 Mcf AF 1,105 psi/48 hrs. development Whites Run pool	1,250 Mcf AF 1,300 psi/72 hrs. extension Trimm pool	1,000 Mcf AF 1,300 psi/72 hrs. extension Trimm pool

COUNTY Permit Number	Warren 32134	Warren 32193	Warren 32204	Warren 32210	Warren 32213	Warren 32214	Warren 32232	Warren 32251	Warren 32257	Warren 32323
NAME OF WELL	Cliff & Patricia Eastman #3	Jensen-Lewis #2	M. Morrison Unit #6	Thomas Reed #3	W. John Smith #1	David Curtis #1	Ralph Eastman #2	W. W. Hammond, Jr. #2	Lloyd McCray #1	John W. Willis #5
OPERATOR	Berea Oil & Gas Corporation	U. S. Energy Development Corp.	Berea Oil & Gas Corporation	U. S. Energy Development Corp.	U. S. Energy Development Corp.	U. S. Energy Development Corp.	Berea Oil & Gas Corporation	U. S. Energy Development Corp.	U. S. Energy Development Corp.	U. S. Energy Development Corp.
TOWNSHIP	Spring Creek	Columbus	Spring Creek	Columbus	Columbus	Columbus	Spring Creek	Columbus	Columbus	Columbus
QUADRANGLE	Spring Creek	Columbus	Spring Creek	Columbus	Columbus	Columbus	Spring Creek	Columbus	Columbus	Columbus
LATITUDE	3,190 ft. S 41°50'00"	3,400 ft. S 41°57'30"	5,760 ft. S 41°50'00"	4,500 ft. S 42°00'00"	3,400 ft. S 41°57'30"	5,700 ft. S 41°57'30"	12,130 ft. S 41°50'00"	6,130 ft. S 42°00'00"	3,735 ft. S 41°57'30"	7,275 ft. S 42°00'00"
LONGITUDE	5,890 ft. W 79°32'30"	11,125 ft. W 79°30'00"	1,740 ft. W 79°32'30"	6,050 ft. W 79°30'00"	8,225 ft. W 79°32'30"	2,065 ft. W 79°30'00"	1,820 ft. W 79°35'00"	7,300 ft. W 79°30'00"	5,335 ft. W 79°32'30"	5,135 ft. W 79°32'30"
DATE COMPLETED	12-13-82	11-23-82	1-3-83	1-15-83	12-21-82	1-12-83	12-28-82	12-6-82	1-24-83	1-26-83
ELEVATION	1518 GR	1548 GR	1578 GR	1622 GR	1453 GR	1446 GR	1595 GR	1699 GR	1486 GR	1485 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/CNL: 0-5022 OLL: 0-5010 PCL: 4600-4992	GR/FDC: 2621-4622 DI/DLL: 2601-4618 Laser: 4300-4600	GR/CNL: 0-5133 DLL: 536-5121 Litho: 0-5133	GR/FOC: 2537-4545 LL: 2638-4540 Laser: 4250-4524	GR/FOC: 2480-4499 OI/LL: 2478-4488 Laser: 4150-4420 PCL: 4275-4388	GR/FDC: 2529-4565 DI/LL: 2524-4545 Laser: 4220-4470 PCL: 4325-4455	GR/CNL: 0-5163 DLL: 0-5151 Litho: 0-5163	GR/FOC: 2621-4630 LL: 2630-4621 PCL: 4414-4536 Laser. 4300-4560	OIL/LL: 2508-4532 FDC/CNL: 2513-4531 Laser. 4200-4450	GR/FOC: 2450-4462 OI/LL: 2400-4463
TULLY	3276-	2880-	3380-	2834-	2770-	2831-	3376-	2904-	2807-	2688-
ONONDAGA LIMESTONE CHERT	3536-	3162-	3644-	3123-	3044-	3116-	3640-	3187-	3080-	2956-
ORISKANY	3692-	Absent	Absent	Absent	Absent	Absent	Absent	3366-	Absent	
HELDERBERG KEYSER-BASS ISLANDS	3702- 3719-	3330-	3785-	3300-	3223-	3282-	3782-	3376-	3257-	3140-
SALINA GUELPH-LOCKPORT	3742- 4418-	3391- 3942-	3849- 4476-	3363- 3927-	3283- 3850-	3342- 3910-	3849- 4462-	3428- 3984-	3320- 3885-	3204- 3774-
CLINTON IRONDEQUOIT	4650- 4702-	4208- 4287-	4750-	4158- 4257-	4101- 4175-	4163- 4242-	4762- 4829-	4232- 4329-	4094- 4208-	4026- 4100-
MEDINA GRIMSBY WHIRLPOOL	4746- 4792- 4912-	4324- 4492-	4860- 5028-	4293- 4458-	4226- 4380-	4280- 4451-	4868- 5038-	4368- 4528-	4244- 4417-	4133- 4300-
QUEENSTON	4922-	4505-	5040-	4470-	4390-	4462-	5048-	4543-	4428-	4314-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4794-4918	4367-4496	4903-5038	4360-4464	4275-4388	4325-4455	4958-5044	4414-4536	4266-4423	4173-4307
TOTAL DEPTH	5025	4617	5155	4575	4496	4591	5172	4655	4529	4476
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,100 Mcf AF 1,250 psi/72 hrs. extension County Line field	1,260 Mcf AF 950 psi/48 hrs. development Dewey Corners pool Columbus field	1,000 Mcf AF 1,250 psi/48 hrs. development Triam pool Sanford field	581 Mcf AF 1,020 psi/48 hrs. development Dewey Corners pool Columbus field	1,596 Mcf AF 1,210 psi/48 hrs. development Deway Corners pool Columbus field	1,170 Mcf AF 1,120 psi/72 hrs. devalopment Dewey Corners pool Columbus field	1,100 Mcf AF 1,300 psi/72 hrs. development County Line field	1,530 Mcf AF 1,150 psi/48 hrs. development Dewey Corners pool Columbus field	150 Mcf Nat. 872 Mcf AF 1,280 psi/72 hrs. development Dewey Corners pool Columbus field	639 Mcf AF 1,025 psi/48 hrs. extension Dewey Corners pool Columbus field

Figure 32. *(Continued)*

COUNTY Permit Number	Warren 32325	Warren 32363	Warren 32394	Warren 32395	Warren 32413	Warren 32487	Warren 32713	Warren 32714	Washington 21460	Washington 21461
NAME OF WELL	Zajac #5	Melvin Messenger #1	Leslie Dodd #3	Leslie Dodd #4	Keeer-Lauger #1	Carter Lumber Company #1	Robert Scott #1	Lloyd Price #1	Harold Ward #1	Anna Johnson #1
OPERATOR	U. S. Energy Development Corp.	U. S. Energy Development Corp.	Universal Resources Holdings, Inc.	Universal Resources Holdings, Inc.	U. S. Energy Development Corp.	U. S. Energy Development Corp.	Monroe Resources, Limited	Monroe Resources, Limited	W. J. Lydic, Incorporated	W. J. Lydic, Incorporated
TOWNSHIP	Columbus	Columbus	Columbus	Columbus	Columbus	Columbus	Freehold	Freehold	Canton	Hopewell
QUADRANGLE	Columbus	Columbus	Columbus	Columbus	Columbus	Columbus	Lottsville	Lottsville	Washington West	Washington West
LATITUDE	9,475 ft. S 42°00'00"	12,800 ft. S 42°00'00"	10,850 ft. S 41°57'30"	12,900 ft. S 41°57'30"	12,125 ft. S 42°00'00"	6,650 ft. S 41°57'30"	2,700 ft. S 41°57'30"	735 ft. S 41°57'30"	7,700 ft. S 40°15'00"	5,900 ft. S 40°15'00"
LONGITUDE	6,650 ft. W 79°30'00"	4,436 ft. W 79°32'30"	1,640 ft. W 79°35'00"	1,730 ft. W 79°35'00"	6,875 ft. W 79°30'00"	8,450 ft. W 79°30'00"	4,950 ft. W 79°27'30"	5,400 ft. W 79°27'30"	9,900 ft. W 80°17'30"	7,000 ft. W 80°20'00"
DATE COMPLETED	12-14-82	2-9-83	1-26-83	1-20-83	2-3-83	2-15-83	4-29-83	4-17-83	6-15-82	7-23-82
ELEVATION	1525 GR	1662 GR	1403 GR	1393 GR	1454 GR	1459 GR	1813 GR	1810 GR	1379 GR	1319 GR
LOGS RECEIVED AND LOGGED INTERVALS	OIL/LL: 2551-4553 FDC/CNL: 2550-4552 Laser: 4150-4500 PCL: 4302-4425	OIL/LL: 2599-4601 FOC/CNL: 2598-4600 Laser: 4320-4570	DIL/LL: 2512-4513 FOC/CNL: 2511-4512	GR/FDC: 2499-4530 DLL: 2456-4530	DIL/LL: 2397-4460 FOC/CNL: 2447-4460 Laser: 4191-4390	GR/FDC: 2600-4596 OI/LL: 2600-4597	OBC/SNL: 2950-4940 DIL/LL: 2951-4941	OBC/SNL: 2896-4876 DIL/GR: 2888-4864	GR/DBC/CNL: 0-6872 GR/IL: 1920-6868 GR/T/S: 1875-6865	GR/FOC/CNL: 0-6797 DLL: 1861-6823 GR/DBC/CNL:80-1862 GR/IL: 84-1855
TULLY	2799-	2945-	2779-	2780-	2738-	2824-	3228-	3194-	6455-	6412-
ONONDAGA LIMESTONE CHERT	3087-	3215-	3056-	3058-	3024-	3112-	3506-	3474-	6714-	6709-
ORISKANY	Absent	Absent	Absent		Absent		Absent	Absent		
HELDERBERG KEYSER-BASS ISLANDS	3258-	3394-	3226-	3226-	3192-	3284-	3668-	3636-		
SALINA GUELPH-LOCKPORT	3317- 3889-	3452- 4018-	3292- 3879-	3292- 3870-	3251- 3821-	3344- 3920-	3766- 4302-	3732- 4266-		
CLINTON IRONDEQUOIT	4145- 4218-	4255- 4340-	4101- 4211-	4140- 4203-	4063- 4148-	4168- 4251-	4556- 4634-	4536- 4598-		
MEDINA GRIMSBY WHIRLPOOL	4254- 4418-	4376- 4546-	4251- 4416-	4250- 4406-	4184- 4350-	4288- 4456-	4672- 4838-	4634- 4800-		
QUEENSTON	4430-	4558-	4428-	4422-	4365-	4468-	4852-	4816-		
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Marcellus Shale	Marcellus Shale
PRODUCING INTERVAL	4302-4425	4429-4449	4292-4368	4298-4365	4230-4357	4341-4462	4724-4848	4692-4813	6593-6698	6603-6657
TOTAL DEPTH	4563	4604	4575	4562	4482	4599	4965	4947	6874	6829
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Huntersville Chert	Huntersville Chert?
RESULTS	1,500 Mcf AF 1,100 psi/72 hrs. development Dewey Corners pool Columbus field	1,162 Mcf AF 1,170 psi/48 hrs. development Dewey Corners pool Columbus field	988 Mcf AF 1,160 psi/48 hrs. development Whites Run pool Columbus field	1,351 Mcf AF 1,200 psi/48 hrs. extension Whites Run pool Columbus field	3,063 Mcf AF 1,215 psi/48 hrs. development Dewey Corners pool Columbus field	2,030 Mcf AF 1,000 psi/48 hrs. development Whites Run pool Columbus field	756 Mcf AF 1,240 psi/48 hrs. development Dewey Corners pool Columbus field	205 Mcf AF 1,150 psi/48 hrs. development Dewey Corners pool Columbus field	400 Mcf AF 2,700 psi/168 hrs. extension Garrett Hill pool Buffalo field	15 Mcf AF 400 psi/48 hrs. Deeper pool discovery Garrett Hill pool Buffalo field

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